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JOURNAL OF EDUCATIONAL RESEARCH

Official Organ of the Educational Research Association

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THE SIGNIFICANCE OF TEACHERS' MARKS

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THE LAW OF THEIR DISTRIBUTION

WITH the progress of pedagogical science and especially with the development of systematized public schools, there has been an increasingly insistent demand for some method of measuring the student's success at school. The first method to suggest itself was some form of rating achievement by the instructor under whom the work had been done.

This quite generally developed into a percentile system, and marks were assigned even to the fraction of a percent, which was a *reductio ad absurdum*. A reaction naturally followed. This reaction brought about the usual present practice of rating students in several groups, generally five; but this was only a concession to the crude and cumbersome character of the measuring instruments. It did not render the ratings any more exact; and, for statistical purposes, the percentile system had advantages, since it rendered possible smoother curves of distribution and was no less correct.[1]

The need of a more perfect implement for measuring school accomplishment led to the development of refined and standardized tests of achievement. With these we are not concerned at present, except to recognize that they are measuring instruments of greater accuracy than the older systems of teachers' marks and may be of value for the purpose of comparison. For some sorts of investigation dealing with the past, teachers' marks must still be relied upon as the only measure we have of school achievement; and it is prob-

[1] Starch, Daniel. *Educational Psychology*. New York, Macmillan Company, 1924. pp. 438-40.

able that for the immediate future, at least, they will be used largely for practical purposes in school administration. Daniel Starch, after a critical discussion of "Marks as Measures of School Work" adds, "They will probably always have to be used."[2] McCall says, "Teachers' marks are important because they are now, and will continue for some time to be, the most universal method of rating pupils. In fact, they may continue forever to be the criterion for classification."[3]

Investigations of teachers' marks in general have been destructively critical. Their unreliability has been emphasized in superlative terms, such as "enormous variation" and "astounding differences," with the accompanying implication that these variations and differences are chiefly expressions of the personal equation of the teachers. In the light of these revelations, the effort has been to establish uniformity in teachers' markings on the basal assumption that the normal-probability, or Gaussian, curve should express the fundamental law in the distribution of teachers' marks. We are not concerned, however, with the question of what the law should be but rather with what the law of the distribution is.

The actual distribution of teachers' marks has been repeatedly shown to approach the normal-probability curve, and this fact has been emphasized as a ground for assuming the normal curve as a basis for uniform marking. Dearborn has said, "the strongest argument, however, for such a distribution of marks . . . . is that it is the one usually found, especially when a fairly large number of students are graded."[4] Professor Hall, in publishing a curve of distribution of marks assigned by him to medical students, made the assertion that no fair-minded judge would for a moment question or doubt that the curve derived from the rating of the 2,334 students is really a binomial curve.[5] Starch, likewise arguing that "the marks of large numbers of unselected pupils should be dis-

[2] Starch, *Op. cit.*, p. 449.

[3] McCall, William A. *How to Measure in Education.* New York, Macmillan Company, 1922. p. 59.

[4] Dearborn, Walter F. *School and University Grades.* Madison, Wisconsin, University of Wisconsin, June, 1910. p. 12. (Bulletin of the University of Wisconsin, No. 368)

[5] Hall, W. S. "A Guide to the Equitable Grading of Students," *School Science and Mathematics,* 6:501-10, June, 1906.

tributed approximately in conformity with the normal distribution or probability curve," gives, as the third point of his argument, the fact that "the distribution of marks assigned by many teachers to large numbers of students conforms fairly closely to the normal-distribution curve." In support of his claim, he publishes four figures which "indicate how closely distributions of the marks at Wisconsin, Cornell, Harvard, and Missouri run parallel to the theoretical curve."[6]

It is to be observed that in these cases the investigator is seeking evidence of conformity to the normal curve and, considering that teachers' marks are crude data and vary "enormously from teacher to teacher and from school to school,"[7] the small departures from the normal are regarded lightly or explained away. Dearborn, comparing his distributions with a normal curve by empirical methods, admits a lack of conformity but treats it as of little weight.[8] Hall specifically notes important divergences but explains them as anomalous.[9] Starch emphasizes the close approach of the college curves in his figures to the theoretical curve and adds, "The only difference is a slight skewing to the right."[10] Finkelstine, on the other hand, has noted the fact of a skew curve in his Cornell studies and has proposed a marking system based on this type which is much more logical.[11]

If the nonconformities of the curves were irregular and tended to counterbalance each other, we might regard them indifferently, even though they were of considerable amount, but it is to be observed that, small though the departures are, "there's method in their madness." We should, therefore, do well to study the type of unconformity.

The final average teachers' marks of each student in the grades of a small school system for a single semester were tabulated by schools, teachers, grades, and classes. The data thus obtained were grouped by five-percent interval of the percentile marking scale,

[6] Starch, *Op. cit.*, pp. 440-42.
[7] Starch, *Op. cit.*, p. 426.
[8] Dearborn, *Loc. cit.*
[9] Hall, *Loc. cit.*
[10] Starch, *Op. cit.*, p. 442.
[11] Finkelstine, I. E. *The Marking System in Theory and Practice.* Baltimore, Warwick and York, 1913. (Educational Psychology Monographs, No. 10)

and the constants were computed by Pearson's method of moments.[12] A summary of such tabulation, with the statistical constants, is given by schools in Table I. School A is an outlying school of

TABLE I

A SUMMARY BY SCHOOLS OF THE DISTRIBUTION OF TEACHERS' MARKS FOR ONE SEMESTER IN A SCHOOL SYSTEM

	School A	School B	School C	School D	School E	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Number of classes	3	16	14	18	13	64
Average marks:						
35–39	.....	.....	1	.....	.....	1
40–44	.....	.....	.....	.....	.....	.....
45–49	.....	.....	.....	.....	.....	.....
50–54	.....	.....	1	.....	.....	1
55–59	6	2	1	3	.....	12
60–64	.....	5	9	11	4	29
65–69	.....	19	21	32	3	75
70–74	3	41	43	60	13	160
75–79	1	71	102	107	26	307
80–84	4	106	51	93	49	303
85–89	9	138	52	70	92	361
90–94	.....	107	10	16	41	174
95–99	.....	9	.....	.....	1	10
Total	23	498	291	392	229	1,433
Mean	.....	83.90	78.46	78.93	84.64	81.43
Median	.....	85.18	78.41	79.23	86.09	82.17
Mode	.....	88.35	80.19	81.72	89.75	84.04
Standard deviation	.....	7.60	7.48	7.23	6.61	7.92
Coefficient of variation	.....	9.05	9.53	9.16	7.81	9.72
Skewness	.....	−.586	−.231	−.386	−.774	−.333
P.E. for normal*	.....	±.037	±.048	±.042	±.055	±.022
Curve type	.....	I	IV	I	I	I

*Probable error of skewness for the fitted normal curve. It is doubtful if a curve can be regarded as significantly skewed from the normal unless its skewness is more than four times the probable error of skewness for the normal. (*See* Pearl, Raymond. *Introduction to Medical Biometry and Statistics*. Philadelphia, W. B. Saunders Company, 1923. p. 277)

twenty-three children in charge of one teacher and doing only the work of the first, second, and third grades; the data are, therefore,

[12] Davenport, Charles B. *Statistical Methods*. 3rd ed. New York, John Wiley and Sons, 1913. pp. 20-21.

insufficient alone for statistical use but are included in the *Total*. The actual distribution of the teachers' marks for the whole school system (the solid line), together with the fitted normal curve (the dotted line) for comparison, is plotted by percent of frequencies in Figure 1.

It is clearly evident that the distributions are in the general form of normal probability and may be said to conform fairly closely to the Gaussian curve. Nevertheless, there is not coin-

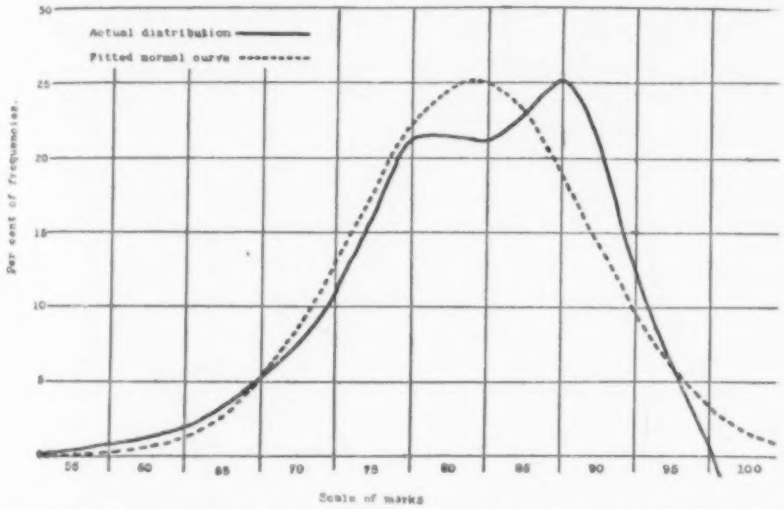

Figure 1. Percentage distribution of teachers' marks in a town-school system plotted with the fitted normal curve

cidence, and it may be noted that the distributions have a definite negative skewness, that is, the mode, which coincides with the mean in a normal curve, is removed from the mean toward the higher end of the scale. Though small, the skewness is statistically significant, for it is more than four times the probable error for the normal curve. In fact, when tested by statistical criteria, these distributions are generally much better fitted by one of Pearson's types, commonly Type I, than by the normal-probability curve.[13] School C may be exceptional. The skewness, —.231,

[13] Various types of curves have been distinguished by Professor Karl Pearson. Type I differs from the normal-probability curve in being unsymmetrical or skewed and limited in range at both ends (see Davenport, *Op. cit.* pp. 19-23).

is barely significant, being less than five times the probable error of skewness in the fitted normal curve. If we compute the constants of the distribution with intervals of 2.5 percent instead of 5 percent, we obtain a skewness of $\pm.1$ or less, depending on the type of curve assumed and the formula for skewness used. This is hardly more than twice the probable error of the normal. Therefore, it may be considered doubtful whether the curve is significantly skewed from a normal distribution. Nevertheless, this distribution differs from the others only in degree, with this possible exception, that we are dealing with something more than chance variations or the personal equations of the teachers.

In respect to the constancy of this type of skewness, we have abundant confirmation from the work of others. Rugg summarized the data concerning the distribution of teachers' marks which had been published prior to 1915, based, as he stated, on "distribution curves covering more than 171,400 teachers' marks, given in seven colleges and universities and thirty-nine high schools (distributed over thirteen states) by several thousand teachers to children and adults from all ages in the school population."[14] He concluded that, "regardless of subjects of study, the typical distribution of teachers' marks results in a form of curve which may be described as skewed to the high end of the percentile scale, namely, the peaks of the curve will lie considerably above the mean of the base line upon which the curve is plotted and above the theoretic mean of the normal-frequency curve plotted on that base."[15] By this description we understand negative skewness as already defined.[16]

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[14] Rugg, Harold O. "Teachers' Marks and Marking Systems," *Educational Administration and Supervision*, 1:129, February, 1915.

[15] It should be noted that Rugg does not distinctly say that the peak or mode is above, or below, the mean of the distribution, which is the only true criterion of a skew curve (*see* p. 166 ff of this article).

[16] Assuming that the marking scale is always so placed that the low end is toward the left and the high end at the right, we understand that "skewed to the right" and "skewed to the high end" mean negatively skewed curves as defined by Yule (*Theory of Statistics*, p. 150), Davenport (*Statistical Methods*, p. 31), and others. Boring calls attention to ambiguity and confusion in the use of these expressions (*Pedagogical Seminary*, 21:269, footnote). Robert Chaddock says, "In skewed distributions the mean and median are pulled away from the mode in the direction of the skew, or the tail of the curve representing the extreme variants," (*Principles and Methods of Statistics*, p. 173), a statement in direct conflict with the definition of

Out of several hundred curves, he considers that not more than two or three percent have been found to be approximately normal.

In all the work cited by Rugg, the distributions are those of the marks of college and high-school teachers, none whatever of teachers in the lower grades. It seems natural to suppose that the distributions of the marks of children in the elementary school are less likely to be disturbed by complicating factors. The idiosyncrasies of college teachers attain to the *n*th degree and are exceeded only by the prevailing sense of self-sufficiency. The conditions are highly favorable to erratic marking. The student himself is subject to a multiplicity of forces, interests, and purposes of which the child in the grades knows nothing.[17] In the elementary school, the marks are given on few subjects, the methods of instruction are highly standardized, and teachers have few incentives to accentuate their personal eccentricities. In fact, owing to the close interlocking of work in the elementary grades, the over-eccentric teacher quickly finds a thorny path.

The data in the first table are based on the average mark for each student in several elementary subjects such as reading, writing, arithmetic, spelling, geography, grammar or language, history, and physiology or hygiene. Music, manual or industrial training, physical culture, effort, and conduct—though given marks—are not included in the averages. The distributions by schools include the combined distributions of thirteen to eighteen classes and of approximately as many teachers. Such treatment of the data tends to neutralize the personal equations of the markers. As Starch asserts, "When the marks of many teachers are combined, the idiosyncrasies of individual teachers tend to be counterbalanced."[18]

Space will not permit a critical review of the suggestions that have been offered in explanation of the skewed curve in the dis-

Yule. Professor Edward L. Thorndike likewise uses the expressions "a form skewed toward the high end" and "skewed toward the low end" (*An Introduction to the Theory of Mental and Social Measurements.* 2nd ed., 1922, p. 33) in the same sense as Chaddock, and evidently directly opposite to the use of Rugg, Starch, and other educational workers. We have, therefore, sought to avoid such expressions. (*See also* Otis, Arthur S. *Statistical Method in Educational Measurement.* 1926. Footnote to p. 76)

[17] For an interesting discussion of these factors *see* Finkelstine, *Op. cit.*, pp. 37-85.

[18] Starch, *Op. cit.*, p. 441.

tribution of teachers' marks. Many of them pertain to accidental and inconstant factors which induce variability only in skewness, yet they are often large enough to conceal completely the underlying law of the behavior of skewness. Such factors must be sought in the nature of the specific distribution and treated as superficial disturbances to be eliminated by a proper handling of the data. We shall be content to discuss those conditions which from their constancy cannot well be eliminated and which constitute the basis of a law that must be reckoned with.

First, skewness is fundamentally a function of the nature of the marking scale. Given a marking scale with fixed limits as in the letter, five-point, seven-point, and similar scales, any shifting of the mode of the distribution above or below the median of the scale will tend to a distribution with corresponding negative or positive skewness, since the range of the distribution may be greater on one side of the mode than it can be on the other. The percentile scale, as commonly used, has practically only one fixed limit, the upper, and an indeterminate median. Under these conditions, negative skewness is more probable than positive skewness. Considering the distributions here given as typical distributions on a percentile scale, it appears evident that 60 is approximately the lower limit of marking, but it is not the absolute limit such as we have at the upper end of the scale where 100 fixes the *ne plus ultra*. The lower limit is relatively determined by the passing mark but not absolutely. Students may be, and are, marked below passing, and the distribution in practice trails out indefinitely into the lower marks. For this reason, the actual median of the scale is indeterminate. In the present cases the passing mark was 75, but it is evident that the distributions extend normally much below 75, and it is erroneous to fix 85 as the scale median or to assume that it ought to be the median of distribution. Either the advancing of the mode or the lowering of the median of the scale, both of which are possible, tends to increase negative skewness. As the mode is crowded toward the immovable upper limit, the skewness is intensified. If this arbitrary barrier were as diaphanous as that of the lower limit, the curve might burst through to the position shown by the fitted normal curve, relieving the pressure around 85—95 and permitting this mode to settle back toward the normal

line. Therefore, high marking from whatever cause tends to negatively skewed distributions, but it does not insure them. A mode at, or somewhat below, the middle of the working scale tends to give a normal curve.

Some may say that this is a truism, that the advance of the mode toward the end of the scale is what is meant by skewness. No, it is not what is meant by skewness. It is theoretically possible to have a high mode, that is, a mode well above the middle of the scale, with a normal curve of distribution, or a curve not significantly skewed. For example, take the distribution in School B. This gives a skew curve with the mode at 88.35 and with a skewness of −.586. Transfer the frequencies of the first four intervals to the last interval, and the distribution becomes as follows:

Class Intervals	Frequencies
75–79	71
80–84	106
85–89	138
90–94	107
95–99	76

The mean of this new distribution is 87.61, the mode is 87.78, and the skewness is −.028 or less than the probable error of the fitted normal curve, −.037. Therefore, with a mode nearly as high on the marking scale as the original distribution, we have a curve not significantly skewed from the normal. A small, highly selected, advanced class in a college course may have its marks legitimately approach such a distribution.

Second, skewness is a function of faulty grading. A study of the distributions shows that there is a small but constant excess of extremely low marks. So far as we may regard such marks as determined by the qualifications of the student for the work of the grade, their statistical significance, in most cases, is that the student is of a different order from the population that is being measured. He belongs to a different type of distribution. From a comparison with the fitted normal curve, it is evident that a mark of less than sixty usually means, in a normal distribution, a deviation from the mean of more than three times the standard deviation. As West has expressed it, such a deviation "must significantly indicate that the measurement is not that of an individual taken from the same material; it does not belong to the same

distribution but to another distribution which has some conditions different from the first."[19] Common sense also tells us that if a student is correctly marked so low in his performance when compared with his classmates, he is utterly outclassed and should be transferred to a different group. In pedagogical terms, he belongs in a lower grade or the special class.

The loading of the lower end of the scale with this atypical material, commonly due to the pedagogical pressure of passing on over-age students, tends to trail out the distribution curve into the low marks since there is no statistical barrier as a check. On the other hand, there is no counterbalance at the upper end of the scale, since students of a superior order, who chance to be retained in the grade, may not be marked beyond the scale limit of 100. The total effect then of faulty grading is a selective distribution within the group, which accentuates negative skewness, in the case of the percentile scale. An excess of low-grade students, especially in the case of the letter or point scale with its fixed lower limit, may counteract the negative skewness resulting in an approach to the normal curve or even give a positive skewness, but such an extreme appears practically improbable. Possibly School C is an example of this sort.

Third, skewness is a function of selective elimination from advanced classes. This has been emphasized by previous investigators chiefly on a priori grounds but has led to great differences of opinion. Rugg in his summary says, "There is evidence that a very influential cause of the constant skewing of mark curves to the high end of the range is the established effect of selective elimination of the poorer students in advanced classes and schools."[20] We shall not discuss this matter as pertaining to the high school and college. In respect to the elementary school, however, the situation is very different. Owing to the laws of compulsory attendance and other causes, elimination becomes transmuted into retardation. The student who drops out of the advanced class reappears in the lower class. Each class receives the eliminations from the class above. As a consequence, there is a

[19] West, Carl J. *Introduction to Mathematical Statistics.* Columbus, Ohio, R. G. Adams and Company, 1918. p. 65.

[20] Rugg, *Op. cit.*, p. 129.

gradual increase of over-ageness in the class until the fifth or sixth grade is reached when these retardates begin actually to drop out of school.[21] It would appear, that in grade schools the general effect would be a small variation in low marks equal to the differential between the numbers who drop out to the class below and the numbers who drop in from the class above. As some of the repeaters may presumably improve their marks on the second trial, the situation becomes complicated and the precise effect on the distribution curve is problematical. Since the retardates tend to accumulate up to the fifth or sixth grade, their effect in consequence of their tendency to low marks would be to induce positive skewness, but this, if at all appreciable, would result only in a reduction of the usual negative skewness of the distribution. As selective elimination becomes real in the higher grades we might expect relatively greater negative skewness in the seventh and eighth grades than in the fourth and fifth, but it is doubtful if the difference could be clearly detected owing to the small proportion of effective retardates in most schools.

Fourth, skewness is a function of student personality. The incentives to high endeavor and the rivalry of competition are stimuli of great potency with a certain type of students. That a few may win many must run. There is the excitement of the game, and "hope springs eternal in the human breast." Hence, the field is but little behind the leaders. There is a crowding toward the goal. The simple fact that 100 is a mark toward which many strive but which none ever attains, while at the other end of the scale there is a bottomless pit, must mean a skewed curve; and this curve will be more definitely skewed when there is in the student body an increased proportion of alert minds with high ambitions to whom the sport of rivalry appeals. This does not mean that the student always consciously strives to make the highest mark, but he responds to the stimulus of leadership. He is eager to do as well as, or to surpass, his fellows; he responds to the excitement of the game. This is to be observed in the way certain hands always fly up in class discussions. Whatever other factors may play a part, skewness is chiefly due to the operation

[21] Banker, Howard J. "Age Distribution in the Grades as a Measure of Mentality," *Journal of Educational Research*, 13:155-70, October, 1926.

of two opposite forces, the bright and energetic students forging to the head and the dull and more listless students dragging out at the tail. Skewness is largely an expression of selection within the group. In fact, our skew curves in all probability are compound, or multi-modal, curves consisting of two populations, each concentrated about an independent center of distribution determined by the presence or absence—in a greater or less degree—of a response to the psychological stimuli for higher endeavor. It would not be difficult perhaps to analyze our distributions into their constituent biological curves were the end gained worth the labor of the undertaking.[22] If the selective action of differential ambition or interest under he stimulus of competition were neutralized or eliminated, the distribution would probably settle back approximately to the curve of innate intellectual capacity; and it might still be slightly negatively skewed from the operation of factors previously discussed.

The teacher's mark is a measure of the relative success of each student in the total activities of the prescribed work. It is, therefore, based upon a complex of reactions, intellectual, emotional, and even physical, modified more or less by environmental conditions. The distribution of marks subject to such combinations of differentiating factors on a scale limited at its higher end and sometimes practically unlimited at the lower, results, as we have seen, in a curve negatively skewed in greater or less degree. A distribution curve unduly skewed negatively suggests not so much error in marking as a pedagogical failure in uniformily arousing sustained effort in the student body.

The distribution of teachers' marks, as a record of comparative achievement, appears to be of the same type as that which exists in the distribution of the performance of contestants in a foot-race or a horse-race and presumably in other competitive efforts.[23] Hence, to require the teacher to conform the distribution of his marks to the normal curve of probability on the ground

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[22] *See* Pearson, Karl. "Contributions to the Mathematical Theory of Evolution," *Philosophical Transactions of the Royal Society of London*, 185:71-110. 1894.

[23] Banker, Howard J. "The Competitive Factor in Skewness," *Journal of the American Statistical Association*, 22:9-21, March, 1927.

that such is the fundamental law of biological variation is to demand that he ignore the forces with which he is dealing. As well might we ask the astronomer to conform his record of the tides to the lunar cycle without regard to the perturbations of the sun. Professor Rugg, in discussing the law that the distributions of human traits conform to the probability curve, describes the results of firing 1,000 shots at a target, and quotes Merriman's observation, "that there is a slight preponderance of shots below the center, and there is reason to believe that this is due to a constant error of gravitation not entirely eliminated in the sighting of the gun."[24] Ought not the scorer to have adjusted his record of the marks so as to have conformed to the normal curve of probability? If teachers' markings are to be reformed in the interest of justice, the reform should be on a basis independent of the curve of distribution. McCall has pointed the way in the development of the teacher's judgment on a scientific basis as a part of his professional training.[25] Incidentally, it may be noted that in consequence of the skew distribution of teachers' marks caution is necessary in the use of the mean or the median as a constant of central tendencies in statistical work. They are not always interchangeable as in the case of normal distributions.

[24] Rugg, Harold O. *Statistical Methods Applied to Education.* Boston, Houghton Mifflin Company, 1917. p. 190.

[25] McCall, *Loc. cit.*

(To be continued)

THE VALUES OF EDUCATIONAL RESEARCH TO THE CLASSROOM TEACHER

CLIFFORD WOODY
University of Michigan

THE MEANING OF RESEARCH

RESEARCH is "a careful or critical inquiry or examination in seeking facts or principles; a diligent investigation to ascertain something," according to *Webster's New International Dictionary.* This definition makes clear the fact that research is not merely a search for truth, but a prolonged, intensive, purposeful search. In the last analysis, research per se constitutes a method for the discovery of truth which is really a method of critical thinking. It comprises defining and redefining problems; formulating hypotheses or suggested solutions; collecting, organizing, and evaluating data; making deductions and reaching conclusions; and, at last, carefully testing the conclusions to determine whether they fit the formulated hypotheses.

The emphasis of research work upon data, controls, and experimentation has conveyed the impression that research must be undertaken in the laboratory and must involve statistical analyses, but such is far from the whole truth, for any careful examination of facts or principles constitutes research. This may be undertaken in the library or the schoolroom, instead of in the laboratory, and criticism may be substituted for statistics in evaluating the data obtained. Any individual who attempts to substitute deductions based on carefully collected facts for those based upon opinions without supporting evidence, and who strives to advance the frontiers of knowledge, is a research worker.

The child who diligently searches through different sources of information to discover a fact and the teacher who applies the most routine types of research materials and methods to a given situation, are research workers as much as the specialists who have had intensive training in research. The outstanding difference in their work is the nature of the results obtained. The child and the teacher will rediscover truths which are probably new to them but old to the specialists, while the specialist will in all probability

reveal heretofore undiscovered truths. Results obtained by the child and the teacher represent a contribution to their individual growth and development; conclusions attained by the specialist represent a general contribution to the world's knowledge.

THE NEED FOR RESEARCH IN EDUCATION

It is generally understood that a university has at least two major purposes—teaching and research. Joseph K. Hart says in his book, *The Discovery of Intelligence,* that teaching is the process whereby the adult generation gives its own world to the new generation. From this point of view, teaching stresses dissemination of knowledge. Research, on the other hand, is a method for the discovery of new knowledge, that is, a method by which is augmented the existing body of organized facts, ideals, and aspirations. Here the emphasis is on the discovery of knowledge.

Both teaching and research are recognized as the legitimate purposes of every institution of higher learning; differences of opinion exist, however, concerning their relative importance. Some contend that good teaching is slighted by too much attention to research. The relative merits of these two activities cannot be discussed here, but it is the writer's conviction that most teachers will be improved by participation in some sort of research and that most specialists in research will be improved by participation in some sort of teaching.

While research has been recognized as a legitimate purpose of the university, the possibility of the high or elementary school as a research institution is a relatively new conception. There is need for the furtherance of research in all our institutions of learning—for that matter, in all institutions capable of engaging in research activities. Herbert Hoover, in one of his recent addresses, bemoaned the fact that research in institutions of higher learning and in business and industrial concerns is not keeping pace with advancing civilization. He pleaded for greater stress upon both pure and applied research in every conceivable line of work. The need for research was also stressed by J. M. Cattell in one of his recent articles. He pointed out that the United States, due to the impoverished conditions of Europe caused by the World War, must be responsible for carrying forth the research work of the world.

In no field is the need for research more apparent than in that of teaching, which now is done largely by rule of thumb. The superiority of one teaching method over another has never been definitely determined. No scientifically established curriculum exists, although some promising efforts have been made to effect one. As yet little has been revealed to indicate that one classroom organization is superior to another. The best method of marking pupils or evaluating instruction has never been scientifically determined. Little evidence is available on the most satisfactory size of class or length of recitation. Virtually no data have been gathered upon how the child learns, although, within recent years, considerable emphasis has been given to investigations in this field. This list could be extended indefinitely and the enumerated activities analyzed in much greater detail. Further analysis would only present more proof that in the science of teaching there has been but little research.

Extended experiments dealing with teaching practices in their natural situations are needed. One who is familiar with educational psychology knows that the great body of data, upon which our psychological laws and principles are based, were developed in the laboratory and in the absence of actual teaching situations. For example, the classic memory investigation of Ebbinghaus was developed in the laboratory by having adults learn nonsense syllables. The key words to which I should call your attention in the previous sentence are "laboratory," "adult," and "nonsense." It is conceivable that different results might be obtained if for those three words "schoolroom," "children," and "sense materials" are substituted. Bryan and Harter's investigation, often quoted in connection with the psychology of learning, deals with the experience of an adult in sending and receiving telegraphic messages. These authors, in their description of the investigation, imply that the facts discovered will apply to the teaching of composition or chemistry. Little evidence exists which shows to what extent this is true. Most of the investigations dealing with the motor and association types of learning involve adult subjects and materials, which are in no way connected with the practical schoolroom situation. Doubtless, these results are significant, but whether the principles evolved will apply to the different schoolroom situations is another question.

The need for a program of research in teaching becomes more apparent when the nature of the so-called "scientific investigations" in that field is considered. In general, many of the investigations are too limited in duration, involve too few subjects, and are too crudely done to warrant satisfactory conclusions. The topics investigated are unrelated, and many of those attempting research have not been properly trained for such work.

What is needed in research is a definite program set up and directed by some capable agency. This program should deal directly with problems encountered by classroom teachers, and should enlist the cooperation of a large number of teachers in the state. The program should be organized somewhat after the fashion of the American classical investigation, the modern foreign language study, or the report on history and other social studies in the schools which was undertaken by the Council of the American Historical Association. In each of the investigations, the major problems dealt with instruction in those particular subjects. These three surveys definitely attempted to utilize the research activities of the nation.

A central agency coordinates the work and does its utmost to keep those cooperating on the job and to see that conclusions reached are reliable. The three investigations mentioned are similar to the attempts made by the Department of Superintendence of the National Education Association to pool efforts of the nation's public schools in building a curriculum. This Department found that it was impossible to make headway in curriculum-building without a program of coordinated work. Consequently, the program was formulated by national committees, and its result can well be described by the headline which appeared in one of our current newspapers sometime ago: "Nation at Work Building the Curriculum." What we need in connection with the teaching of each subject is a slogan something like this, "The Teachers of the Nation at Work on Instructional Problems."

VALUES OF PARTICIPATING IN A RESEARCH PROGRAM

Participation in research work gives expert training in research.—Most teachers have not specialized in methods of research, but, in all probability, they are required to participate in research

programs under direction. These teachers undoubtedly can follow the directions formulated by some capable agency and thereby learn the methods of launching an investigation, the nature of the controls which must be set up, and the procedure used in tabulating data and arriving at conclusions. Participation in directed research teaches how to become a specialist in independent research. Therefore, one of the values derived from cooperation in a research program is in the attainment of a technique of research.

Participation in a research program of any type almost always results in superior teaching.—If research work involves the use of a control group, superior teaching results in both the control and experimental groups. A survey of the results of different investigations involving instructional research will show, almost without exception, greater improvement in the experimental group and the control group than is made in the schools or classrooms without experimentation. Research work presents a challenge to both pupils and teacher, but the challenge to the teacher is the vital factor to be considered. This challenge may be caused by the knowledge that results of teaching are being carefully measured, but the newly created interest in investigation is the fundamental cause. Teaching may occasionally become dull and seem the same from year to year. Such feelings are signs of teaching senility, and, unless new challenges are afforded, an untimely educational death will occur. Research supplies the new challenge, new interests are created, new energies released, and new enthusiasm revealed. The educational world takes on a new color, and unexpected and hitherto unattained achievements result. Participation in instructional research almost invariably results in improvement in instruction.

Participation in a program of research provides a great stimulus to professional growth.—Participation necessitates a clear formulation of the problem under consideration. Furthermore, during the course of the investigation many more problems will be suggested. It has often been stated that perhaps the greatest value of research lies not so much in the conclusions reached as in the problems raised in connection with the investigation undertaken. In an attempt to understand the problems raised and to draw conclusion, the research workers will have to read a considerable amount of literature

relating to the investigation at hand. Interpretation of the results frequently leads to a complete reorganization of one's past thinking. One of the values, then, of participation in problems of research is in the re-evaluation of past thinking, for much of the learning of the past must be reviewed in present problems.

Participation in a program of research provides a mass of information with which to interpret current articles in educational periodicals.—Almost all the educational journals now publish articles dealing with scientific studies. If one is not familiar with experimental technique and the scientific terms used, reading of these articles will become burdensome. However, if the individual has developed a knowledge of experimental technique and experimental terms through participation in an investigation, he has developed a core of knowledge which gives him a basis for interpreting the scientific articles. Furthermore, he has developed a skill and interest which will enable him to read critically and to remember the outstanding facts concerning the investigation reported.

Participation in a research program will aid in establishing teaching as a profession.—One of the qualifications of a profession is the existence of a body of subject-matter peculiar to that profession. Subject-matter which is relevant to effective teaching is altogether too meager and too superficially established. Year by year, however, it is increasing and is becoming more scientifically established. If the teachers in each state cooperated in one well-directed investigation each year, the value of the contributions made would be enormous. The existence of an array of these contributions would surely form one basis of a true profession of teaching, and a knowledge of the contributions would aid materially in gaining for teachers the professional respect which they deserve. Knowledge of a specialized subject-matter would also aid in the development of our profession by discouraging the "floating" and the "stepping-stone" teachers. So long as we have a teaching procession we shall never have a teaching profession.

Participation in research is often rewarded either directly or indirectly by monetary rewards.—In some school systems, the completion of a satisfactory investigation receives direct consideration in arranging salary schedules. Satisfactory completion of a prob-

lem in research is frequently made the requirement for a particular type of promotion. Occasionally, research work is made equivalent to a certain unit of attendance at institutions of higher learning. In most cases, however, the monetary rewards for participating in investigations come indirectly. As has been previously indicated, research results in the improvement of teaching, and efficient teaching in the high schools sooner or later is rewarded. If the reward is not given in one school system, it will be given in another. Emerson's anecdote about the world's making a beaten path to the door of the man in the wilderness for his mouse-trap holds for teaching just the same as for building mouse-traps. The world is full of teachers, but the number of good teachers, who are deviating from the usual procedure and who are guided in their deviations by sound philosophy and scientific research, is relatively small. The school world is willing to pay almost any price for these rare individuals, and any teacher in the nation who through study and research becomes a master-teacher in a particular subject will be appropriately rewarded.

Successful participation in research results in certain spiritual satisfactions.—Almost all of us are admirers of geniuses, and most of us take pride in relating that some particular genius was associated with us or our father, or at least with our ancestors, or that he once lived in our home town, county, or state. Something of the same feeling of pride results when we feel we have had a part in the discovery or establishment of some new fact or principle. The announcement of a significant contribution in any field brings gratification and spiritual rewards not only to the individual who is directly responsible for the contribution, but also to all those who were in any way connected with it. This resulting pride fills all concerned with inspiration, and gives a feeling of confidence which spurs on to other similar efforts and to greater parts in making new contributions. The joy of these spiritual values is the drive which makes great scholars. Nothing succeeds like success. Thus the spiritual satisfaction which comes from successful participation in research activities is the priceless reward. This reward in a greater or less degree is open to the teachers of the nation if they care to avail themselves of existing opportunities.

WHAT'S THE MATTER WITH PSYCHOLOGY AND MEASUREMENT?[1]

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MY SPACE allowance may be small, but my topic is large, not to say lanky. I must state a few fundamentals only, and leave them both defenseless and dogmatic. Since I do not seek to convince but to stimulate self-conviction, my request to the reader is that he treat my propositions as though he were the proposer. I regret that I cannot take the space to show how my ideas have evolved from conflicts with my colleagues, whose quarreling has blessed me, nor to deal with the fruitful friction I have had with philosophers and administrators.

I write as an educator with the bias of a psychologist, nay more, the bias of the bias of a statistical psychologist. I am not ashamed of this faith, for out of psychology have come the major contributions to education in recent years. Having praised it, let me proceed to chastise it in harsh words of affection.

1. Educational psychology "sheds a leading light" for educational measurement. It is pre-eminently important that this light be clear. It has not been.

2. Most of the psychological fundamentals are very old truths constantly being renamed. This hurts psychology, but it helps to provide reputations for those more skillful in coining new names than new ideas. You know and I know that the easiest road to fame in education, today, is for a man with some ability and much personality to take a little grain of new, or often old, truth, magnify it to a mountain, rename it, provoke a debate by this very lack of balance, and ride to fame on the resulting wave of publicity, while others who try to see things true and see them whole, who seek that higher synthesis which will allay controversy, will be fortunate to receive half as much attention. These coiners of new names for old things, these capitalizers of controversy, think that we love a dog fight better than we love the truth; I fear that they are right.

[1] An informal paper read before Section Q of the American Association for the Advancement of Science and before the Psychology Club, Teachers College, Columbia University.

3. Psychology has failed to give clear guidance to measurers of education, because it has not shown the way out of this wilderness of terminological redundancy. Misled by their own terminology, it is not uncommon for writers of psychology textbooks to devote different chapters to one functional identity.

4. Dr. Thorndike's telescoping of the psychology of knowledges, skills, and what may be called the mental mechanisms, in general, now needs to be done for that psychological realm at present commanding chief attention, namely, the realm of purposes. At present, this realm is a veritable maze of redundant terminology and artificial separation of what is a continuous unity. Even those who have spent years in the study of educational psychology are still bewildered when asked to give a clear statement of the dynamic relationships of purposes, ideals, attitudes, interest, effort, emotions, readinesses, wants, wishes, desires, preferences, drive, attention, aims, character, good citizenship, taste used in the esthetic sense, and other related terms which have a psychological, or semi-psychological, significance.

5. All this chaos can be reduced to the following simple pattern, though other terms could be substituted for the common garden variety I have chosen:

INTENSITY of DESIRE { for ? / to be ? / to do ? }

6. The former of the two elements in the foregoing pattern, namely, *intensity,* varies in amount whereas the latter element, namely *desire,* varies in its direction, as indicated by the words and question marks which follow it.

7. The elaborate psychology suggested by the terms already listed can be collapsed into this simple pattern of two variables. Purposes, ideals, attitudes, readinesses, wants, wishes, desires, preferences, drive, aims, taste, and the purposive aspect of character and good-citizenship are the equivalent of desire, or of desire plus its direction. Since attention and effort vary directly with interest and are merely a manifestation of it, we can eliminate these, leaving only interest and emotions to be fitted into the above pattern. Interest readily reduces to the degree of *intensity.* This collapses everything except emotions.

8. Some psychologists feel rather shaky about the emotions and hence ignore them; some are so shaken by them that they become incoherent; some seem to find them deleterious to learning and therefore dismiss them with an unceremonious condemnation in general; some with an ascetic turn of mind class them along with Freudianism as not being very nice; and some give them a sort of mythical significance, believing emotions to have a peculiar psychology all their own. The rank and file of us who do not pretend to any abstruse knowledge of psychology occasionally regret that an emotion sometimes disturbs the clarity of our thought, but we do not hesitate to prefer our emotions to the lucidity of a Newton. And, in this, the rank and file of us are right.

9. This "big, blooming, buzzing confusion" at the very mention of emotions is due to the fundamental misconception that they are few in number, and that all of them are charged with dynamite. Just as truly as there are emotions of anger and of love, there are emotions for triangles, binomial theorems, apple trees, and coefficients of correlation. Emotions are not few; they are legion. They are not all powerful; some are very weak. We have made the grievous error of labeling as emotion only those feelings that are powerful, and we have thus lost sight of their fundamental psychological continuity with the multitude of feeling states which constitute the mass of our affective life. The same psychologist who condemns emotions as deleterious to learning pleads for the value of interest, which is really a kind of emotion or feeling. The truth is that the worth of an emotion to learning depends upon its relevance. Give continuous relevance, the stronger it is the better it is.

10. The degree of an emotion is exactly equivalent to the *intensity* of *desire*, and the object or direction of emotion is identical with the direction of *desire*. In sum, there is no need to carry around with us an extra psychology of the emotions.

11. Thus we arrive at the thesis that the psychology and measurement of a multitude of supposed entities, reduces to the twofold aspect of just one simple thing. The task of working out the details of this one thing is great enough without making it many times more difficult by attempts to keep separate that which is one.

12. The totality of an individual is not measured when we have determined the *intensity* and direction of all his *desires*. This gives

us the most important and most dynamic part of him, but not all of him.

13. To achieve those *desires* sufficiently *intense* to seek achievement, the child must be equipped with the requisite mechanisms. Nature provides through immediate heredity or delayed heredity, namely, maturing, those more fundamental mechanisms needed to achieve the more instinctive *desires*. Many of the mechanisms must, however, be provided by education.

14. Just as the multiplier of *desire* is the degree of its *intensity* so the multiplier of *mechanism* is the degree of its *perfection*.

15. Hence the psychological totality of an individual is composed of a pattern consisting of four essential elements:

INTENSITY of DESIRE PERFECTION of MECHANISM

16. From the point of view of measurement, the basic problem then is to determine for each individual, what *desires* he possesses and the *intensity* of each, and what *mechanisms* he has and the degree of *perfection* of each. To this should be added the problem of measuring the pupil's capacity for each of these four elements.

17. Measurement should devote its attention to testing only those *mechanisms* that may be called method or procedure *mechanisms*. Reading, writing, typewriting, composing, computing, map-reading, utilization of sources of information, thinking, originating, inventing, and so on up to higher and higher and subtler and subtler *mechanisms*, if there be higher ones, are method *mechanisms*. Many of them are founded upon information, but it is always integrated information. Thus information concerning the significance of latitude and longitude is, or can be, made an integral part of the method *mechanism* of map-reading. I believe that measurers should cease their efforts to measure information apart from the method *mechanisms* requiring the information. To continue efforts in this direction will tend to perpetuate the encyclopedic conception of education. With our encyclopedias as thick as they have become, it is doubtful whether there is any information as such which is of most worth. We rightly prize that deposit left in us by education much more than the information which we have long since forgotten. This deposit or power consists of the methods of work or method *mechanisms* we have acquired. These are worthy direct

aims of education and measurement. We have scarcely begun the task of identifying and constructing tests for evaluating the numerous *mechanisms* of this type.

18. From the point of view of educational psychology, the basic problem is to determine the laws and procedures for inculcating the appropriate *desires* with the appropriate *intensity*, together with their corresponding method *mechanisms* with the appropriate degree of *perfection* of each, and of making adequately permanent that which has been inculcated.

19. There are fundamental differences between the psychology of the *intensity* of *desire* and the psychology of the *perfection* of *mechanism*. Some ten years ago I wrote a small volume, setting forth my views concerning the differences and similarities between the psychology of purposes or *desire* and the psychology of *mechanisms*. Since I have never had the temerity to publish this account, I shall refrain from propounding a twentieth thesis.

HEALTH AND PHYSICAL EFFICIENCY OF CITY TEACHERS

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THE HEALTH and physical efficiency of teachers have generally been considered as dependent upon such school conditions and teaching factors as size of classes, length of experience, age and sex of teachers, salary, marital relations, type of school, and the like. But what published data is there to support these opinions? Has it been proved that those who teach more than forty pupils are subject to a greater number of days of disabling illness during the year than those who teach fewer pupils? Is it known to what extent age and length of experience occasion ill health? Does the type of school tend to determine the amount of sickness to be found annually among teachers, as was indicated in a report made in Cleveland by the Director of Reference and Research? For example, is the hazard of teaching in an elementary school greater than that of teaching in a high school or in a kindergarten? Does the type of community bear any relation to the number of days of sick leave required during the year? These and many other questions concerning the health of teachers and teaching factors await answers supported by concrete data.

OPINIONS OF SUPERINTENDENTS

As long ago as 1896, Superintendent T. M. Balliet, of Springfield, Massachusetts, summarized, in his annual report, answers to certain questions he had sent to his teachers about the strain resulting from teaching a large number of pupils or from teaching more than one class in the same room. The replies ranged from an estimate of 10 percent, to the estimate of several teachers that as much as 75 percent of all cases of physical breakdown were due to extra work occasioned by large classes. The report stated that "effort ought to be made to reduce the number of pupils in a room to about forty, where they are of the same grade; and to thirty-five where there are two grades in the same room."[1] These

[1] Springfield, Massachusetts. *Report of the School Committee of the City of Springfield, Massachusetts.* 1896. p. 18.

groups. Teachers between the ages of twenty-one and thirty aver-

opinions of a superintendent and his teachers are typical of opinions held and frequently expressed by many educators throughout the profession.

One of the best questionnaire studies was made by Dr. Thomas D. Wood, of Teachers College, Columbia University. In 1916, ten thousand questionnaires were sent to teachers and supervisors throughout the State of New York. On the basis of two thousand returns received, Dr. Wood wrote a report entitled *Health of Teachers.*[2]

Of objective studies made in this field, the writer has been able to locate but three: one in 1916 by Louis I. Dublin, statistician for the Metropolitan Life Insurance Company; another in 1922 by J. Y. Hart, of London; and a third made in 1924 by the writer.[3] Contrast with these three the numerous studies and investigations which have been made in the fields of measurements and materials. For example, in the *Teachers College Record* for November, 1925, Professor Thomas H. Briggs published a list of 145 references in the one field of curriculum study. Other phases of teaching and administration have been subjected to much more careful scientific investigation than has that of the teaching personnel.

FINDINGS FROM THE CLEVELAND STUDY

Quite at variance with frequently expressed opinions and with the generalizations of teachers' associations about factors related to the illness of public-school teachers, are many of the conclusions reached after an extensive examination of teaching data. Dr. Wood reported "on the whole, an increase of ill health in the older age groups." A study of data for the four thousand teachers of Cleveland during the school year 1922-23 showed a decreasing average number of days of disabling sickness in the older age

[2] This report was published in pamphlet form by the New York State Teachers Association, but it is now out of print.

[3] Dublin, Louis I. *Physical Disability of New York City School Teachers.* New York, Metropolitan Life Insurance Company, 1916.

Hart, J. Y. "An Investigation of Sickness Data of Public Elementary School Teachers in London, 1904-1919," *Journal of the Royal Statistical Society,* 85:349-90, May, 1922.

Carrothers, George E. *The Physical Efficiency of Teachers.* New York, Teachers College, Columbia University, 1924. (Teachers College, Columbia University, Contributions to Education, No. 155)

young married women—had the greatest amount of illness to be

groups. Teachers between the ages of twenty-one and thirty averaged 5.3 days of illness for the school year. The next older group, those between thirty-one and forty, had an average of 4.7 days illness, 11 percent fewer days of illness than the younger teachers. The next older group had an even better record, and teachers between the ages of fifty-one and seventy showed the best record of all. The youngest group had 23 percent more days of illness than the oldest group (see Table I).

When the total number of teachers was separated according to sex, the same tendency toward a smaller amount of sickness among the older teachers was noted for each division, but the tendency among men was more striking. The average for the youngest

TABLE I

AVERAGE NUMBER OF DAYS OF ILLNESS BY SEX AND AGE GROUPS

AGES	MEN		WOMEN		ALL TEACHERS	
	Number	Days Ill	Number	Days Ill	Number	Days Ill
(1)	(2)	(3)	(4)	(5)	(6)	(7)
21–30.....	98	2.8	1,324	5.5	1,422	5.3
31–40.....	180	1.9	1,121	5.2	1,301	4.7
41–50.....	85	1.6	653	5.1	738	4.7
51–70.....	68	1.5	383	4.8	451	4.3
All.....	431	2.0	3,481	5.3	3,912	4.9

group of men was 2.8 days a year. The next older group dropped to 1.9 days or 33 percent fewer days of illness than the younger men had. The oldest group of men, those between fifty-one and seventy, had 46 percent less illness than the men of the youngest group (see Table I). The probable errors of all these averages were computed. In no case did they exceed 0.27.

Married teachers were separated from unmarried teachers and comparisons were again made. Married women averaged 30 percent more days of illness than unmarried women. In fact, the married women of every age group had greater amounts of illness than any group of unmarried women, and the youngest married women had 50 percent more illness recorded against them than the corresponding group of unmarried women. This group—the

Summarizing the data of Tables I to III, we may say that, under teaching conditions as they existed at Cleveland in 1922-23,

young married women—had the greatest amount of illness to be found in any group among the 3,912 teachers of the city, 60 percent more than the average for all teachers of Cleveland for that year. Among both married and unmarried women the younger teachers had the greater amount of illness (see Table II).

TABLE II

AVERAGE NUMBER OF DAYS OF ILLNESS BY AGE GROUPS—WOMEN TEACHERS

Ages	Unmarried Women		Married Women	
	Number	Days of Illness	Number	Days of Illness
(1)	(2)	(3)	(4)	(5)
21–30.....	1,180	5.2	144	7.8
31–40.....	921	4.9	200	6.1
41–50.....	525	4.7	128	6.3
51–70.....	322	4.7	61	5.4
All.....	2,948	5.1	533	6.6

TABLE III

AVERAGE NUMBER OF DAYS OF ILLNESS BY AGE GROUPS—MEN TEACHERS

Ages	Unmarried Men		Married Men	
	Number	Days of Illness	Number	Days of Illness
(1)	(2)	(3)	(4)	(5)
21–30.....	45	3.6	53	2.2
31–40.....	33	2.6	147	1.7
41–50.....	6	0.3	79	1.7
51–70.....	8	1.3	60	1.6
All.....	92	2.8	339	1.8

Data for men teachers showed 58 percent more illness for the school year among unmarried men. In checking the men for age groups, it was found that young unmarried men were the ones most frequently ill, this group having 63 percent more days of recorded illness than the corresponding group for married men. The average days of illness for married and unmarried men are given in Table III.

after two days of rest than on Friday after a week of strenuous teaching. When figures for all men were used together, the com-

Summarizing the data of Tables I to III, we may say that, under teaching conditions as they existed at Cleveland in 1922-23, women teachers are subject to two or three times as much illness as men teachers, that the older the teachers the fewer days of illness they have, and that to provide for the running of schools with as few interruptions as possible the Board of Education ought to employ as teachers only married men and unmarried women.

ILLNESS AND DAYS OF THE WEEK

One of the ever-present administrative problems of a large city system is that of having at hand an adequate supply of competent

TABLE IV

AVERAGE NUMBER OF DAYS OF ILLNESS AMONG MEN TEACHERS BY AGE GROUPS FOR MONDAY AND FRIDAY

(Numbers the same as in Tables I and III)

AGES	UNMARRIED		MARRIED		ALL MEN	
	Monday	Friday	Monday	Friday	Monday	Friday
(1)	(2)	(3)	(4)	(5)	(6)	(7)
21–30	.82	.60	.30	.43	.70	.51
31–40	.42	.42	.33	.37	.30	.38
41–50	.17	.17	.46	.33	.35	.32
51–70	.38	.38	.27	.38	.28	.38
All	.60	.49	.38	.38	.43	.40

substitute teachers to fill the places left vacant when the regular teachers are compelled to drop out temporarily on account of disabling sickness. "This is our hectic Monday morning," remarked a principal of a large school one day as the writer stopped to keep an appointment made a few days previously. "Telephone messages have come that twelve teachers are ill, and the substitute department at headquarters is unable to fill a third of the vacancies. You will just have to excuse me for awhile."

Later the principal said he felt sure that more teachers were absent on Monday than on any other day. This suggested the collection of pertinent disability data for each day of the week separately. When the findings were completed they showed that teachers were subject to a greater amount of illness on Monday

SICK-LEAVE POLICIES

after two days of rest than on Friday after a week of strenuous teaching. When figures for all men were used together, the combined data for age groups for the four hundred years of service showed that young men, those twenty-one to thirty, had approximately 38 percent more illness Monday than on Friday. Men teachers in the oldest group, those fifty-one to seventy, did appear to wear out by the end of the week, for they had 37 percent more illness on Friday than on Monday (see Table IV).

In practically every age group among both married and unmarried women the Monday average was larger than the Friday average. The largest amount of sickness recorded for any one day

TABLE V

AVERAGE NUMBER OF DAYS OF ILLNESS AMONG WOMEN TEACHERS BY AGE GROUPS FOR MONDAY AND FRIDAY

(Numbers the same as in Table II)

AGES	UNMARRIED		MARRIED	
	Monday	Friday	Monday	Friday
(1)	(2)	(3)	(4)	(5)
21–30.....	1.10	1.47	1.67	1.54
31–40.....	1.06	0.96	1.41	1.18
41–50.....	1.01	0.95	1.37	1.37
51–70.....	0.94	1.00	1.28	1.08
All.....	1.06	0.99	1.46	1.31

of the week for a single group was for young married women teachers for Monday (see Table V).

Among men teachers the data showed that young unmarried men had about 30 percent more illness on Monday than on Friday. By the end of the week they were getting into condition for a full day's work. The young married men were apparently ready for work on Monday and had on that day 31 percent less illness than on Friday (see Table IV).

These findings are of vital importance to the supervisor of the substitute department, to principals of schools, and to the budget-making committee. The expense for the one item of substitute teaching in Cleveland for the year 1922-23 reached $163,000.

ent, in cities of eight thousand population and more, ninety-seven

SICK-LEAVE POLICIES

Boards of education in almost all cities of the United States have made some sort of provision for sick leave for regular teachers. However, little objective evidence in this field has been made available for use in guiding superintendents in their attempts to formulate equitable policies. This present investigation was undertaken that further objective data might be compiled in usable form upon both the question of the amount of disabling sickness prevailing among city teachers, and the further question of the different amounts of illness which are associated with the several well-known teaching factors frequently referred to as causes of physical disability.

In an unpublished study made by N. L. Engelhardt, assisted by E. L. Baxter and other graduate students, it is clearly shown that superintendents and boards of education have but vague notions as to why they allow "full pay for ten days" or "no pay" or "five days less substitute's pay" or "ten days with an additional ten days on half pay" or "one-third pay for ten days" or any other one of the ninety-seven varieties listed. In Cleveland, where the ten-day sick-leave rule holds for all teachers, it was thought that the "ten" was decided upon because there are ten months during which schools are in session, and that since 89 percent of the teachers are women, one day a month should be allowed off duty with pay.

The variety of plans given in the Engelhardt report in regard to the amount of pay allowed teachers while ill, and the lack of agreement as to the best policy to be followed even among as many as one-sixth of the cities, show how little the question has been studied. For example, a board of education always allows the same number of days sick leave to men as to women, even though it is known that women teachers will have two to three times as much illness during the year as men teachers. About all that can be said at present in regard to a definite, consistent policy is that a majority of boards of education in cities in the United States feel that some cognizance ought to be taken of the fact that teachers are subject to sickness and absence from duty the same as other workers, and that provision of some sort ought to be made for part payment of salary during the period of illness. At pres-

ent, in cities of eight thousand population and more, ninety-seven different varieties of sick-leave plans are being tried.[4]

ONE-DAY-A-MONTH POLICY

A check on the working of the one-day-a-month policy, or ten days during the year, showed no evidence of regularity of absence each month for women teachers in the city of Cleveland. As further evidence that no unusual amount of this sort of special consideration need be given to women, attention is invited to a report by Dr. Charles A. Swan, medical director of the Halle Brothers Company, Cleveland, Ohio. The following quotation is taken from this report:

> Considering the fact that 65 percent of the employees are women, dysmenorrhea is less important than one would expect. One might expect, on first thought, that frequency of absence among women would be due to conditions peculiar to the sex, such as dysmenorrhea. However, while this is true to a certain extent, the explanation seems to be more that the women are more susceptible to all types of illness than men, and that they are more likely than men to consider minor illness as sufficient grounds for absenting themselves from work.[5]

In addition to obtaining from members of the Cleveland educational staff information relative to the half-month's allowance on full pay, the "Proceedings of the Board of Education" for the past thirty years were examined in an attempt to discover the basis for the regulation allowing ten days of sick leave with pay each year. In 1900, the Board granted one-half pay to teachers who were "absent on account of illness," provided the same did not extend beyond twenty consecutive days. Later, this was changed to ten-days full pay and ten additional days on half-pay. This was again changed to five days on full pay and ten additional days on half-pay. Three days of absence on pay were added for death in the family. Other changes were made from time to time as the Board seemed to be feeling its way toward the best policy to pursue until 1912, when the Board apparently rested from its labors in this field and left the sick leave at ten days on pay for each

[4] Taken from a study made by E. N. Engelhardt and E. D. Baxter which contained a table showing the pay granted to teachers during absence on account of illness, in American cities having populations of eight thousand or more (mimeographed report).

[5] In the table, "Common Causes of Absenteeism," Dr. Swan gives dysmenorrhea 7.2 percent. *See* Swan, Charles A. "Causes of Absenteeism among Store Workers," *The Nation's Health*, March, 1923.

teacher each year, men and women, married and unmarried, young and old, alike.

It is stated by some Cleveland teachers that the ten-day policy was established only after a questionnaire had been widely circulated and, as the report of Engelhardt and Baxter showed, the ten-day rule was found to be the most prevalent. For the moment, let it be assumed that this is the way the question was finally settled. To what extent has the questionnaire method of arriving at solutions of school problems been accepted as valid? If the policy found to be in general use is a wrong one, its pernicious influence gets a wider extension. There ought to be a more scientific method of arriving at a solution.

EXPERIENCE AND PHYSICAL DISABILITY

As stated above, opinion has it that teaching is a hazardous occupation. In the superintendent's report, to which reference has already been made, it is stated that "about one-half of all the teachers in our primary and grammar schools give it as their deliberate judgment that a teacher cannot teach longer continuously than from five to seven years without positive injury to health." Concrete data on which the judgments were based were not found in the report. A study made in Cleveland of the total days of disabling sickness among unmarried women teachers in the elementary schools of that city over a period of five years, 1917-22, indicated no correlation between physical disability and length of service. The information was obtained for all unmarried elementary women teachers who taught continuously in that city for the five-year period and for whom a complete record was available. The correlation between days of illness and length of service was $+.02 \pm .04$. A similar study of the records of all unmarried elementary women teachers in Springfield, Massachusetts, for the year 1922-23 yielded a correlation coefficient of $+.07 \pm .04$. Again it is seen that longer experience is not associated with greater illness. The corresponding correlation coefficients for married women teachers were: Cleveland, $r = -.194 \pm .09$; Springfield, $r = -.0028 \pm .08$.

The results of these studies of the health of elementary teachers in Cleveland and Springfield—one of them covering a period of

five years—stand in contrast with opinion. In each instance, the figures show that a greater number of days of illness is not associated with longer experience in teaching.

TEACHING IN FOREIGN SECTIONS

Is the physical hazard of teaching in a city system greater for those teachers who are assigned to foreign sections than for those teaching in the American districts? Using the bulletin, *Census of Nationalities Represented in the Cleveland Public Schools* we placed in one group those schools which had "U. S. White" pupils listed first or most numerous and in a second group all the schools

TABLE VI

NATIONALITY OF PUPILS AND ILLNESS OF TEACHERS

Nationality of Pupils	Number of Schools	Number of Teachers	Average Annual Days of Illness among Teachers
(1)	(2)	(3)	(4)
U. S. White listed first or most numerous..	55	1,291	5.245
Other nationalities listed first or most numerous.....	41	1,282	5.256
All.....	96	2,573	5.250

Difference of Means = 0.011 ± .273

where other nationalities were found predominating. Table VI summarizes these data showing the relation between the nationality of the pupils and the health of the teacher.

In this study, there happened to be almost exactly the same number of teachers in the first as in the second group. The average number of days of illness per teacher is the same in each group. This is not conclusive evidence since so many other factors enter, but when the large number of teachers involved is considered, and since the probable error of the difference of the means is so much larger than the difference itself, we are practically certain that as good a state of health is maintained by teachers in the foreign sections of a cosmopolitan city as in the sections designated "U. S. White."

VARIATIONS BETWEEN TYPES OF SCHOOLS

W. W. Theisen, while Director of Reference and Research of the Cleveland public schools, investigated the question, "Why do elementary schools show much greater percentage of teacher absence?" He attempted an answer to the question in part as follows: "Since the proportion of men teachers is largest in senior high schools, the disparity between the elementary schools and the high schools appears smaller when only women teachers are considered. There is still a large difference to be explained."[6] The paragraphs which follow give an explanation of this "large difference."

The records of all women teachers of Cleveland were taken, not merely those who had been absent "from six to ten days." The following summary gives the findings for 3,479 teachers for the schools year 1922-23:

	Number of Teachers	Days of Illness
Senior high schools.....	337	5.28
Junior high schools.....	589	5.08
Elementary schools.....	2,553	5.29

These figures show no disparity in amount of illness between different types of schools when only the women teachers are considered. Men alone could not be considered for that year since there were but twenty men teaching in the elementary schools.

As a still further check on the absence of elementary teachers because of illness against that of high-school teachers, the records of all women who taught continuously in Cleveland from 1917 to 1922 were compiled. The same findings were obtained as those shown in the summary just given, except that the average number of days of illness for each group was just under five days instead of five plus. This was because the young teachers with their characteristic high averages were necessarily left out of the count.

TEACHING IN CONGESTED AREAS

In the study made by J. Y. Hart in London, "the percentage of necessitous children on the roll provided with school meals was

[6] An unpublished study made in Cleveland in 1922.

taken . . . . [as the] criterion of the nature of the district." He found "the coefficient of correlation between illness [of teachers] and nature of district is +0.052 (P.E. 0.08)."[7] This means that teachers in congested areas are subject to no more sickness than those in the better districts.

In Cleveland, the one hundred fifty schools were rated by assistant superintendents and supervisors. The schools located in favorable surroundings were rated "1"; those in downtown, congested, noisy, and generally unsatisfactory places were rated "3"; and those in between these extremes were rated "2." After the ratings were secured, the total number of days of sickness for all

TABLE VII

AVERAGE DAYS OF ILLNESS RELATED TO EXTRA TEACHING BY REGULAR TEACHERS

	Number of Teachers		Days of Illness	
	Who Did Extra Teaching	Who Did No Extra Teaching	Who Did Extra Teaching	Who Did No Extra Teaching
(1)	(2)	(3)	(4)	(5)
Men.....	132	301	1.35	2.28
Women.....	145	3,334	4.21	5.30

teachers in the schools of Groups 1 and 3 were secured for the five-year period 1917-22. In the outlying schools (Group 1) there were 58 buildings with a total of 1,812 years of service and with an average of 4.54 days of illness per teacher each year. The down-town schools (Group 3) had 36 buildings and 1,433 years of teaching service with an average of 4.40 days of illness per teacher each year. The difference of these averages is 0.14 of a day per teacher in favor of the down-town schools. The probable error of this difference is 0.323—a figure so large that it renders the difference of no significance. In other words, teachers in down-town, noisy, congested districts appear to run no greater risk of health impairment than do teachers in the open, residential portions of cities.

[7] Hart, *Op. cit.*, p. 379.

EXTRA TEACHING

The statement is frequently made that extra teaching on the part of regular teachers is injurious to their health. Cleveland has limited by board ruling the number of evenings during which a regular teacher may be employed in extension schools to three a week. New York permits employees to handle the matter as each individual teacher thinks best. Certain other cities prohibit all extension teaching on the part of regular teachers.

Table VII gives the summary of data collected for 3,912 teachers in Cleveland for the year 1922-23 and shows clearly—at least for that city—that, contrary to expectation, extension teaching not only did not cause illness but seemed actually to be associated rather closely with better health.

The women who handled only their regular work had 25 percent more illness than those who did extra teaching. The men who handled only their regular work, in so far as the schools were concerned, had nearly 70 percent more illness than the men who did extra teaching. This does not mean, however, that in order that Cleveland teachers may keep well it is necessary to engage in extension teaching, although this might help somewhat. There are several possible explanations of the better health record discovered among the extension teachers, three of which will be given here[8]: (1) In order that extension work might continue with the least possible interruption, the extension supervisors placed good health as an important qualification for an extension worker to possess. However, no special means were employed to determine the health of applicants. (2) Those doing extension teaching usually stated that they would give up the extra work if it should be found to interfere with their regular teaching or general efficiency. (3) The extension teaching is probably handled quite largely by teachers who are living more normal, regular lives, and who are carrying extra responsibilities in family and personal affairs.[8]

CONCLUSIONS

1. Women in the teaching profession in every type of school appear to have a greater number of days of disabling sickness than men.

[8] Others may be found in the monograph by the writer which has already been mentioned.

2. Married women teachers are subject to greater amounts of sickness than are unmarried women.

3. Unmarried men teachers are subject to greater amounts of sickness than are married men.

4. Dysmenorrhea is of much less significance than it is usually considered to be.

5. Such teaching factors as size of classes, type of school, teaching in foreign or in congested sections of cities, age, experience, extra teaching, and the like which have usually been thought to be associated with physical strain, appear to bear no significant relation to the number of days sick leave required each year.

6. The figures given in some of these tables seem to show by concrete evidence what we have so often been told in words, "that work is a big boon, a sort of medicine, a health-producing, sanity-saving tonic." Data thus far analyzed appear to warrant the conclusion that many of the teaching factors frequently referred to as causes of illness and of breakdown are not found associated with the larger amounts of illness.

This study was undertaken for the purpose of obtaining concrete data on school and teaching conditions, and the tentative conclusions given appear to be warranted as a result of the careful check made on approximately twelve thousand years of teaching service in three large cities. Many of the findings were not what the author had expected and it is hoped that the tentative conclusions may serve as a means of stimulating further investigation in this hitherto unexplored field. Data on rural teachers in a few counties have been collected, and other data from both rural and city systems are being secured by the writer and by other investigators. These, at best, can hope to do little more than touch the surface of such a far-reaching and important problem. An extensive study carefully planned and amply financed might well be undertaken by the National Education Association or some other recognized professional organization as a means of bringing about a better understanding of the teaching personnel and the conditions under which teachers work.

WITHDRAWALS FROM JUNIOR HIGH SCHOOL

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CONSIDERABLE attention has been given to the holding power of the junior high school and to the adjustment of the school to the pupil. Much time and effort has been spent, as it should be, in adjusting the curriculum to the needs of the individual pupil. In schools whose enrollment is large enough to permit the segregation of pupils into homogeneous ability groups, the important question confronting the teachers and administrator is "To what extent does a course of study for the slow group differ from that for other sections?"

Before the question raised can be answered, a study should be made to determine what relationship, if any, exists between intellectual ability—as determined by standard tests—and "staying ability." The writer found, in a previous study, a close relationship between achievement in school work and the intelligence quotient. It seems fair, therefore, to take the intelligence quotient as a measure of intellectual ability.[1] We have always known that, generally speaking, the better students remained in school and the slower ones dropped out as soon as the law permitted. The present study represents an attempt to determine quantitatively, from objective data, this relationship. Local conditions, of course, always determine to some extent the number of withdrawals from school. Nevertheless, it is believed that the local conditions in the city from which these data were collected are not materially different from conditions in hundreds of other communities throughout the United States.

Since the junior high-school system was organized in Fond du Lac, Wisconsin, incoming pupils have been given the Otis Group Intelligence Tests, and records of withdrawals from school have been kept. Names of the 316 pupils who entered Garfield Junior High School in September, 1922 and 1923, were tabulated, for the purposes of this study, in the order of their intelligence quotients.

[1] "Teachers Marks and Intelligence," *Journal of Educational Research*, 11:123-31, February, 1925.

The total number was divided into six groups—Group I, those of highest ability; Group VI, those of lowest ability. Pupils who moved out of the city were not included in the study. With this one exception, the tabulations included all pupils who were promoted to this school during 1922 and 1923.

Pupils who have been in school nine years or who have finished the eighth grade may, in Wisconsin, withdraw from school and go to a part-time vocational school until their eighteenth year, provided they are employed when they are not attending vocational school. Except in rare instances, a pupil withdrawing from junior high school does not return to finish his high-school course, but goes into industry and various blind-alley jobs.

TABLE I

PERCENTAGE DISTRIBUTION SHOWING THE PORTION OF EACH GROUP WHO WITHDREW

	Boys	Girls	Total
(1)	(2)	(3)	(4)
Group I	.....	1.6	1.6
Group II	.9	.3	1.2
Group III	1.7	.6	2.3
Group IV	.9	2.5	3.4
Group V	4.7	1.6	6.3
Group VI	7.4	2.8	10.2
Total	15.6	9.4	25.0

The tables express, in several different ways, the distribution of the boys and girls who dropped out of school before finishing the junior high school. The percents given in Table I are based on the number entering junior high school, while the percents in Table II are based on those withdrawing.

Table I indicates that of the 316 pupils who entered junior high school, 15.6 percent of the boys and 9.4 percent of the girls did not remain to finish. In other words, exactly 25 percent dropped out of junior high school some where along the line. Of the 25 percent who withdrew, less than 2 percent ranked among those of highest intelligence, and these were all girls. No boys of Group I left school during the junior high-school period. Of the original enrollment, 10 percent of those who dropped out were in Group VI.

In Table II the percents are based on the number of withdrawals from school. In other words, this table shows the distribution of the 25 percent (indicated in Table I) among the six intelligence groups. Slightly more than 6 percent of the withdrawals were in the group having the highest intelligent quotient and nearly 40 percent were of the lowest, with increasing percents between the extremes from the highest to the lowest intelligence. No boys in Group I quit school, and nearly 30 percent of the pupils who did withdraw were boys in the lowest group. Although the variation in percents among the girls is less marked, nevertheless, a larger percent of withdrawals is found among girls of a lower intelligence quotient than among the brighter ones.

TABLE II

PERCENTAGE DISTRIBUTION SHOWING THE PORTION OF THOSE WITHDRAWING WHO BELONGED TO EACH GROUP

	Boys	Girls	Total
(1)	(2)	(3)	(4)
Group I	.....	6.1	6.1
Group II	3.7	1.2	4.9
Group III	7.3	2.5	9.8
Group IV	3.7	9.8	13.5
Group V	18.6	6.1	24.7
Group VI	29.3	11.0	39.3
Total	62.6	36.7	99.3

TABLE III

PERCENTS OF THOSE WHO WITHDREW WHOSE INTELLIGENCE QUOTIENTS WERE ABOVE AND BELOW THE MEDIAN

	Boys	Girls	Total
(1)	(2)	(3)	(4)
Above median	11	10	21
Below median	51	27	78
Total	62	37	99

Table III gives a comparison of the number of boys and girls above and below the median in intelligence, who withdrew from

school. Slight difference exists between the boys and girls among the 21 percent above the median who withdrew. Of the 78 percent below the median, 51 percent were boys and 27 percent were girls. Of the total number of withdrawals, 62 percent were boys and 37 percent were girls.

The percent of the original enrollment which withdrew is portrayed in Table IV. Of the original pupils in Group I, 9 percent withdrew, and 61 percent of Group VI. Of the 61 percent who dropped out of the slowest group, 44 percent were boys, and only 17 percent were girls. Even in Group V, more than three times as many boys as girls withdrew, the ratio being 27 percent of the boys to 9 percent of the girls.

TABLE IV

PERCENT OF EACH GROUP WHICH WITHDREW

	Boys	Girls	Total
(1)	(2)	(3)	(4)
Group I	.....	9	9
Group II	6	2	8
Group III	11	4	15
Group IV	6	15	21
Group V	27	9	36
Group VI	44	17	61

Summarized, the facts shown in this study are:

1. One-fourth of the pupils who entered junior high school did not remain to finish.

2. Twice as many boys as girls withdrew from junior high school.

3. Almost twelve times as many pupils withdrew from Group VI, the group having the lowest intelligence quotients, as from Group I, the group with the highest intelligence quotients.

4. Sixty-one percent of the group with the low intelligence quotient withdrew, more than two-thirds of whom were boys.

The school has revised its course of study in such a manner that everything taught has some intrinsic value although it may furnish a foundation for more advanced study. Pupils have been segregated into homogeneous groups on the basis of their intelligence

quotients, thus making it easier to adjust subject-matter and method to the capacity of the individual pupil. Elective subjects have been offered in the eighth and ninth grades further to adapt the course of study to the pupil. Clubs and extra-curricular activities have been provided in abundance to make it possible for each pupil to find something of vital interest which would impel him to remain in school. We believe that these various devices have held many pupils in school and that they have been desirable in themselves without reference to the retention of pupils. It seems doubtful, however, if we shall ever reach that degree of perfection where every pupil will want to continue in school after he reaches the age where he may lawfully quit.

What are the implications of the data here summarized? Why do so many more of the pupils with low intelligence quotients withdraw, and so many more boys than girls? Is there any basis in psychology for the larger withdrawals among the boys and pupils of low intelligence quotients? A pupil in classes for those with low intelligence quotients has as much chance to make good as has the brighter pupils. Subject-matter is varied to meet his ability, and a different yardstick is used for measuring the results on which the term marks are based. Have we not gone far enough in this direction, or is there some other solution of the problem? Do girls really like school better than boys, or do they stay in school because they are more influenced by the desire of the approval of society which sanctions an education, than are the boys, whose withdrawals have been traditionally tolerated, if not tacitly condoned by society? While boys like to earn money, does this explain the overwhelmingly large number of withdrawals among those of low intelligence quotients? These are a few questions which this study suggests, but to which it gives no satisfactory answer.

A STUDY OF THE NON-VERBAL NATURE AND VALIDITY OF MYERS MENTAL MEASURE

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WHEN a school administrator or examiner is faced with the problem of selecting a test to measure the mental ability of a group of children, many of whom have language handicaps, he desires evidence on at least two questions: (1) Compared with other tests, how much is the language factor of the test weighted? and (2) How well does the test correlate with other valid and reliable measures of intelligence? The purpose of this article is twofold, to examine the results yielded by the Myers Mental Test to discover whether it tends to eliminate the effect of language differences[1] to a greater degree than does a strictly verbal intelligence test, and to report correlations between the Myers Mental Measure and the McCall Multi-Mental Test and to compare these with the other findings on the validity of the Myers test.

The results which follow are based upon test records of 327 children from homes of non-English-speaking immigrants and 278 children of native American parentage. The pupils in both groups were between eleven and twelve and a half years of age and were taken from the same seventeen public schools in the poorest districts of a large eastern city. The writer had access to the complete test records for 2,456 pupils who entered the schools of this city in the kindergarten or first grade and who were, at the time of the testing, between the ages just mentioned.[2] From this large sampling the two groups which form the basis of this study were selected. The 327 pupils represent a random sampling of all the children examined whose fathers and mothers were born abroad and speak some other language than English most of the time. The American Group of 278 is made up of a random sampling from the pupils examined whose parents were born in the United States and speak

[1] The Myers test does not require any ability to read words, numbers, or letters. It consists exclusively of pictures, and the authors state that it is applicable to all ages and degrees of school experience. Directions are given orally, and in English only. See Myers, C. E., and Myers, G. C. *Measuring Minds.* New York, Newson and Company, 1920.

[2] The administering and scoring of all tests were under the strict supervision of Professor W. A. McCall of Columbia University, Professor Harriet O'Shea, of Bryn Mawr College, and the writer.

English as their mother tongue. The division of the children into non-English-speaking and English-speaking groups was made on the basis of the children's replies to the following five questions:

(1) What language does your mother speak at home most of the time?
(2) What language does your father speak at home most of the time?
(3) In what country were you born?
(4) In what country was your father born?
(5) In what country was your mother born?

No child was included in either group who, in answering the third question, stated that he was born outside the United States. A pupil was classified in the non-English-speaking group if his replies to the other four questions indicated definitely that both his father and mother spoke some other language than English most of the time and had been born in some foreign land. If the experimenter was in doubt concerning the trustworthiness of any child's answer due to omission or apparent inconsistencies, he omitted the case from the study. Mental ages for all pupils were obtained by the Myers Mental Measure and the McCall Multi-Mental Scale; educational ages, by the Stanford Achievement Test, Advanced Form.

If the children from homes where foreign languages are spoken almost exclusively are examined on a verbal and on a non-verbal intelligence test, it seems reasonable to suppose (1) that they would make a lower score on the verbal test than a group of children of the same innate capacity who do not have this language handicap; (2) that on a non-verbal test a foreign group, as compared with an American group, would be at a smaller disadvantgae than on a verbal test; and (3) that the amount by which the average mental age based on a verbal test exceeds algebraically the mental age based on a non-verbal test would be greater for the foreign than for the American group.

An actual case reported by Pintner gives the following mental ages, which are typical of what we should expect logically:

	Foreign Group	American Group
Number of cases.....	165	121
Pintner Non-Language (Non-verbal)	9–4	9–4
National Intelligence Test (Verbal)	8–7	9–0[1]

In this case the difference between the scores on the verbal and non-verbal tests for the Foreign Group is 9 months; whereas the differ-

[1] Pintner, Rudolph. "Comparison of American and Foreign Children on Intelligence Test," *Journal of Educational Psychology*, 14: 294, May, 1923.

ence for the American Group is only 4 months. If a non-verbal test and a verbal test were so standardized that they yielded equal scores on the average for an American group, we should still expect a foreign group to do better on the non-verbal than on the verbal.

The scores on the Myers Test and the Multi-Mental Test were subjected to the three logical tests just mentioned. The results, which are reported in Table I, are expressed in T-score units[4] because these proved more convenient to work with in this particular case. The reasoning of the previous paragraph, however, is in no way affected by the use of T-score units for mental-age units.

TABLE I

AVERAGE T-SCORES OBTAINED ON VERBAL AND NON-VERBAL TESTS BY EACH GROUP

	Number of Cases	Mean	SD_m	Difference	$SD_{diff.}$
(1)	(2)	(3)	(4)	(5)	(6)
McCall Test:					
Foreign group...	327	42.77	.42	.....	.....
American group.	278	43.70	.49	−.93	.64
Myers Test:					
Foreign group...	327	40.60	.44	.....	.....
American group.	278	41.12	.52	−.52	.68

The fact that the average score on the McCall test is higher than that on the Myers test for both the Foreign Group and American Group has no particular significance. This difference for the American Group is due probably to a difference in the standardization of the two tests. The probability that this is the true explanation for the difference, or a part of the difference, is strengthened by the fact that the average mental age computed for the 2,232 cases, from which the smaller samplings of this study were taken, was 130.98 months according to the McCall test and 119.96 months according to the Myers.

The important point is to determine whether or not the Foreign Group did better on the Myers than on the McCall. If the figures 42.77 and 40.60 are taken at their face values, it does not seem so. However, it has just been shown that the Myers is yielding lower

[4] For explanation of T-score, see McCall, W. A. *How to Measure in Education.* New York, Macmillan Company, 1922.

scores on the average than the Multi-Mental throughout the study. If we take the averages based on 278 Americans, we find that we should add 2.58 to the average Myers score to bring it up to the McCall test (43.70 − 41.12). If 2.58 is added to the 40.60 (making 43.18), we get an approximation of the Myers score that would have been obtained most probably on the Foreign Group, if the scores on the Myers and McCall tests had been equated in the process of their standardization. This calculation involved only a small error, since the mental level of the tests was about the same for both groups.

Now subtract 42.77, the score on the McCall, from the 43.18, the corrected score for the Myers. The difference of .41 thus obtained means that when the verbal and non-verbal intelligence measures of the American Group are equated, the average score for the Foreign Group on the Myers non-verbal test is .41 T-scores higher than that on the McCall verbal test. Of course this same result will be obtained by subtracting the entries in the *Difference* column in Table I, namely, .93 and .52.

This difference of .41 is in the direction that our logic would indicate that it should be if the non-verbal test is really giving a better chance than the verbal to those who have language handicaps. However, the size of the difference is extremely small; so small, in fact, that it cannot be considered a significant difference. The experimental coefficient[5] was found to be .16, which means that the obtained difference is sixteen one-hundredths as large as would be necessary in order that one might be certain that the difference is above zero. Another way of saying it is that the chances are 67 out of 100 that the difference is above zero and in favor of the non-verbal test; whereas the chances should be 997 out of 1000, if we are to have practical certainty.[6]

Our general conclusion is either that the language handicap was not appreciably greater for the Foreign Group than for the American, or else that the Myers non-verbal test has done little better than the McCall in eliminating the effect of this language handicap

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[5] *See* McCall, W. A. *How to Experiment in Education.* New York, Macmillan Company, 1923.

[6] *See* Garrett, H. E. *Statistics in Psychology and Education.* New York, Longmans, Green and Company, 1926. pp. 134-35. Also McCall, *Op. cit.*

It should be added parenthetically that the distributions of both groups on both tests were examined in detail, but nothing was found to indicate that the comparisons of averages was in any way unfair.

on intelligence-test scores. Of course, the children of the Foreign Group had attended American schools for a considerable length of time, for their average chronological age was approximately eleven years eight months; and their average number of months in school was approximately 58. But, since the American Group had had similar opportunities in school, it is difficult to believe that the Foreign Group had practically no greater language handicap than the American Group. The two groups were so chosen that differences in ability to handle the English language would be noticeable.

TABLE II

CORRELATION BETWEEN MENTAL AGES OF MYERS MENTAL MEASURE AND McCALL MULTI-MENTAL TEST

	Number of Cases	Correlation Coefficient r	PE_r
(1)	(2)	(3)	(4)
Foreign group	327	.49	.03
American group	278	.43	.03

The Myers test, however, which intends to weight language factors less than do strictly verbal tests, does not show conclusively that there is *any* language handicap on the part of the foreign children. Therefore, as answer to the question, "Compared with other tests how much is the language factor weighted?" we must answer that our facts indicate that the Myers test has not eliminated the effect of differences in ability to use the language. Indeed, it proves to be little, if any, better than a pure verbal test in this respect. The fact that a test is composed exclusively of non-verbal material is, therefore, no proof that it has merit as a non-verbal test.

Though the Myers test does not seem to have one of the important characteristics of a non-verbal test, namely, that it tests mentality irrespective of language, still it may be a valuable intelligence test. It may have high validity and reliability for children who do not have language handicaps. The point to be noted, however, is that it must be examined no longer as a non-verbal test, but must be submitted to the same criteria as other tests which do not claim to be non-verbal. The extent to which a given test correlates with other relatively valid and reliable measures is a criterion often used in the field of verbal, abstract intelligence tests. In Table II the correlations between Myers Mental Measure and McCall Multi-Mental Test are presented for each group.

The fact that the Myers and the McCall tests do not correlate highly with one another does not of itself prove that either or both may not be valuable measures of intelligence, because, with correlations no lower than those above, each test may, conceivably, be measuring different aspects of intelligence very well. But, if one of these tests proves to correlate highly with other valid and reliable measures of intelligence as shown in the gradual accumulation of evidence, while the other yields low correlations, the burden of proof tends to be thrown upon the latter.[7]

In the literature only one article was found which gave correlations on the new Multi-Mental Test. McCall reports a comparison of Multi-Mental, National Intelligence, and Stanford Revision of Binet Test in terms of correlations obtained between each and "a highly reliable and comprehensive criterion." The *r*'s for two separate samplings of each test were:

Grades	Number	McCall Test	National Intelligence Test	Binet Test
III-VII.....	141	.90	.95	.81
III-VIII.....	92	.93	.93	.89[8]

Several investigators have reported correlations found between the Myers test and various other tests which may be summarized as follows:

Myers—Stanford Revision . . . . . .80[9]
Myers—Army Alpha . . . . . .35[10]
Myers—Miller Test of Mental Ability .32[11]
Myers—Otis Group test. . . . . .56[12]
Myers—Terman Group Test. . . . . .55[13]

[7] The coefficients of correlation between the Myers test and the Stanford Achievement Test, Advanced Form, were .51 and .50 for the American and Foreign Groups, respectively; the *r*'s between the Multi-Mental and the Stanford Achievement were .80 and .73 for the American and Foreign Groups, respectively.

[8] McCall, W. A. and his students. "The Multi-Mental Scale," *Teachers College Record*, 27: 109-20, October, 1925.

[9] Myers, C. E. and Myers, G. C. "A Group Intelligence Test." *School and Society*, 10: 355-60, September 20, 1919. Also the article by G. C. Myers, "A Grave Fallacy in Intelligence Test Correlations," *School and Society*, 11: 528-29, May 1, 1920.

[10] Jordan, A. M. "The Validation of Intelligence Tests," *Journal of Educational Psychology*, 14: 416, October, 1923.

[11] Miller, W. S. "Administrative Uses of Intelligence Tests," *Twenty-first Yearbook of National Society for the Study of Education*. Bloomington, Illinois, Public School Publishing Company, 1922. pp. 189-222.

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When examined on the two points of validity suggested in this paper, namely the non-verbal nature of the test and the agreement with other relatively valid and reliable measures of intelligence, the Myers test shows no results which will specially recommend it.

SUMMARY

Both the Myers Mental Measure, a test composed of non-verbal material, and the McCall Multi-Mental, a test composed exclusively of single words, were given to a group of children from homes where only English was spoken, and to a second group from homes where little or no English was spoken. If the language factor were weighted less in the Myers test than in a strictly verbal test the former should yield higher scores, on the average, than does the verbal test. This study shows that there was no significant tendency for the Myers examination to assign higher scores to the Foreign Group than a test composed exclusively of words stripped of any context. The Myers test, having shown no strength in eliminating language factors, was submitted to the more or less commonly used criterion of examining a test's correlation with other relatively valid and reliable measures of intelligence. It proved to correlate to the extent of .46 with the Multi-Mental, a new test which according to McCall's findings has a correlation of .91 "with a comprehensive and reliable criterion of intelligence." According to the four reports found by the writer in the literature, one experimenter found the correlation between the Myers and another well-known intelligence test to be .80; three other workers reported correlations which range from .32 to .56. The gradually accumulating evidence seems to shift the responsibility of proving its validity more and more upon the Myers test.

THE LEAVE OF ABSENCE IN UNIVERSITIES AND COLLEGES

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THE PURPOSE of this study was to survey current practices in regard to granting leave of absence in universities and colleges, since the problem is a recurrent one with the college administrator. The following questionnaire was sent to the presidents of eighty institutions of various sizes and types, selected to represent all sections of the country.

1. Does your institution grant a *leave of absence* to its faculty members?
2. How many years of service are necessary before such a *leave of absence* may be granted?
3. What is the length of the absence allowed in years? Maximum? Minimum?
4. Will your institution grant a faculty member this absence without salary?
5. Does your institution grant full or partial salary to a faculty member while on leave?
6. How many years of service are necessary before any salary while on leave will be allowed?
7. What portion of the salary is allowed?
   (Indicate: full, half, quarter, etc.)
8. List any other conditions your institution makes in granting the *leave of absence.*

Replies were received from seventy-five institutions which were classified on the basis of enrollment of students according to the scheme proposed in Table I. Of these institutions, all except four in Class III and ten in Class IV granted leave of absence under some conditions. Those not granting such leave were among the smaller newer institutions.

The answers to the second question, which ascertained the years of service before a leave was granted, showed that practice varied greatly. Three institutions in Class II, seventeen in Class III, and fifteen in Class IV had no definite rule. With the other twenty-six institutions, the range was from one to ten years with a definite mode (fifteen cases) at seven; five had six years as the period.

The leave of absence was generally granted for one year. The minimum length in eleven cases was one-half year, and the maximum in one case was three years. An extension of time was gen-

erally granted if the member of the faculty had research to complete. Practically all the institutions approved of granting leave of absence without salary when the desire to do further research was the reason given for the request, though four institutions did not favor the plan. Forty-three of the sixty-one institutions granting the leave of absence gave some form of financial aid; eighteen gave none. The aid given varied from full salary in three cases to one-sixth salary in one case. Twenty-three institutions, or more than one-half of those giving aid, designated one-half salary. The next most common arrangement was to grant the difference between the salary of the man on leave and the amount paid the substitute.

The answers to the last question indicated a further variation in the practice of institutions. The reasons given for granting the

TABLE I

PLAN FOR CLASSIFYING THE INSTITUTIONS

Class	Enrollment	Number of Institutions	Number Granting Leave of Absence
(1)	(2)	(3)	(4)
I.....	5,000 and more	4	4
II.....	1,000–4,999	4	4
III.....	500– 999	28	24
IV.....	Less than 500	39	29

leave of absence were: research and study, health and rest, travel, and temporary appointment to another institution. A number of institutions granted the leave only for the first two reasons. When the latter reason obtained, no salary was given.

The leave of absence was granted only to full professors in two institutions; to the heads of departments only in three; to professors and associate professors in two; to professors, associate professors, and assistant professors in four; while in others the rank of the members was not made a condition. One institution announced that "between applicants for the leave of absence, those with the longer record of service were favored." Several others announced that "each case was determined on its own merits, on the best plan possible."

To protect the institution, several stipulated that the leave of absence would be granted, "only if the finances of the institution warranted it," or "if the board of trustees saw fit." Others granted the leave to but one member at a time, while others stipulated that the absentee return to the institution or refund a portion of the salary received.

The results of this study may be summarized as follows: Of the seventy-five institutions from which replies were received, fourteen granted no leave of absence under any condition, eighteen allowed leave of absence without salary, and the other forty-three gave some form of financial aid. Seven years of service was most usually expected before a leave of absence was granted, especially if financial aid was given. Even then, the aid in more than half the cases was designated to be one-half the regular salary. The usual period of the leave was one year and was granted for a variety of reasons. If the rank of the member was considered, it was not given to members below the rank of assistant professor; and some institutions limited it to those of higher rank. Further study of the question should be made, especially with reference to the benefits to be derived by both the faculty member and the institution.

EDITORIALS

PROFESSIONALIZED SUBJECT-MATTER

Schools for training teachers are now rounding out the first century of their existence in this country. During the greater part of their career they have exemplified a conflict between subject-matter and method. Some normal schools have been famous for their emphasis upon academic subjects, others for their devotion to the technique of teaching, and still others for an attempt to give prominence to both these types of courses. All, or nearly all, of the teacher-training institutions have separated subject-matter from method. When the teacher-to-be was studying mathematics, he was taking liberal arts courses pure and simple, and presumably was adopting the point of view of the liberal arts college. On the other hand, in his course in teaching mathematics, his attention was upon something entirely different and apart from his studies in pure mathematics.

Such a dualism is an unnecessary weakening of the effectiveness of teacher training. This has been abundantly recognized in theory, although by no means generally in practice. It appears most probable that an integration will be effected through the utilization of a professionalized subject-matter.

The professor in the liberal arts college is right when he says, "No person can teach what he does not clearly understand." He is right again when he says, "The greatest weakness in a teacher is lack of scholarship." Wide margins of mastery far beyond what is likely to be used in the classroom give poise, dignity, assurance, and the indispensable leadership which the teacher should possess.

The kind of scholarship, however, which the academic professor has in mind is not the only kind of scholarship nor, indeed, the kind which is most relevant to teaching in the public schools. Here, as elsewhere, we must bear in mind the purpose of the training to which we subject these students. Theirs is not the scholar's pur-

pose, for his purpose is a selfish one. He acquires competence in a given field as a personal possession; and in its less lovely aspects this is easily transmuted into intellectual snobbery. On the other hand, the purpose of the student in training for teaching is the professional purpose to capitalize scholarship for the sake of public education.

Accordingly, in the words of Dean James E. Russell, "The material of instruction in a professional school cannot be measured by academic standards. The needs of the practitioner in his practice are the sole standards for determining what should be taught." A normal school may well teach chemistry, but it is not its function to turn out chemists. It should undoubtedly teach language, but it should not aim to produce linguists or philologists. The "professional focus" should always be in evidence. It should lead to a distinctive treatment of subject-matter, a treatment strictly relevant to the purpose in hand, namely, the training of teachers. It is a tragic mistake on the part of the academic professor—a mistake too often exemplified in his own person—to suppose that the moment the bare knowledge of a fact is attained, it qualifies a person to teach it to others.

Thirty or forty years ago the materials for a professionalized subject-matter did not exist; or, if they did exist, they were either too small in amount or too much lacking in authority to afford a satisfactory body of teaching material. At present the situation is entirely different. We are almost embarrassed by the array of materials of use in the professional treatment of subject-matter. It is no longer necessary—perhaps it never was necessary—to carry margins of control in teaching elementary mathematics by requiring the student to study calculus, differential equation, vector analysis, and group theory.

It will not be long, we suspect, before the more far-seeing faculties of colleges of education will introduce, for the training of teachers of English in elementary schools, such courses as the following: a survey of juvenile literature; folklore—Asiatic, European, and American; children's literature in the nineteenth century; modern fiction for children; contemporary juvenile periodicals; plays for children; The Fabulists I—Aesop to Marie de France; The Fabulists II—La Fontaine to Joel Chandler Harris;

Scandinavian mythology; the vocabulary and style of childrens' classics; principles of literary criticism applied to myths; fairy tales; and folklore. Why not? Is there not here an attractive field both of teaching and of research? May not courses such as these be made as dignified, as meaningful, and as exacting as courses concerned with the Lake Poets or the Restoration Drama? The prospective teacher of English in the elementary school may well study some of the present offerings, but why not study something about the kind of literature she is going to use? Why may we not ask that our teachers be, to some extent, literary critics of the verse and prose which they find in current textbooks? Scholarship, of course; but must scholarship be remote and useless to be acceptable?

We have said that abundant material for professionalized subject-matter has recently been made available. In no subject is this more apparent than in arithmetic. The modern teacher cannot afford to be ignorant of the use of diagnostic tests in arithmetic nor of the analysis of errors which such tests make possible. Through such an analysis the teacher may learn the causes of errors among individual pupils and may prescribe remedies. There is a growing body of critical literature concerning the items of the arithmetic curriculum, the conformity of these items to the needs of life, the frequency with which the items or facts are used, and the difficulty which they present to the learner. The psychology of arithmetic has lately become something more than a name. It presents for the teacher in training, as well as for the teacher in service, a body of doctrine—some of it exceedingly well verified—as to the way children learn numbers and number processes.

With still further reference to arithmetic, we have lately learned, through the writings of some of our keenest educational thinkers, how helpfully for the learner we may analyze large topics into progressive steps for the purpose of mastery. The doctrine of "unit skills" is giving a good account of itself. In long division a rather sketchy analysis will reveal as many as fifteen or twenty types of examples, each type characterized by a difficulty which the one before it did not have. These types will recognize such things as whether the quotient figures are apparent or not apparent, whether or not the learner has to carry in multiplying, whether or not he has to borrow in subtracting, whether or not he has to write a zero

in the quotient, how many figures there are in the divisor, how many there are in the quotient, and whether or not there is a remainder. According to such an analysis, we ought to begin long division with the type which has a two-place divisor and a one-place quotient. Moreover, this first type should have an apparent quotient (got by dividing the first figure or first two figures of the dividend by the first figure of the divisor); and it should involve no carrying in multiplying and no borrowing in subtracting. Such examples as $41\overline{)87}$ or $52\overline{)386}$ belong to this type.

Again, analysis has shown us ways of separating types of number facts and then of combining them into groups—all for the purpose of more economical and complete mastery. In fact, the relevant subject-matter in arithmetic is astonishingly large. Moreover, some of it is cultural to a high degree. The study, for example, of the history of the process of long division is extremely illuminating. We are apt to accept this rather stereotyped procedure as a matter of course. The story of the development of the present technique reveals it as a "hard-won item in the racial inheritance."

We have said nothing about the new and rapidly developing study of textbooks, the examination and comparison of courses of study, the suggestive literature on problem-solving, the accounts of scientific experimentation in method, and all that goes to make up what we term "the literature of the subject," but perhaps we have said enough to show that a body of professionalized subject-matter does exist. We insist that there is here an opportunity for a scholarship as liberalizing, as vital, and as energizing as the scholarship of which most of us have hitherto been thinking. We are of the opinion that by using materials of this type we may integrate subject-matter and method into an instrument of training more potent than either. We entertain the hope, too, that by this means we may afford systematic treatment of elementary-school subjects on college and university levels and lift the work of the elementary grades into its merited place of honor.

B. R. B.

NEWS and COMMUNICATIONS

The Institute of Social and Religious Research, of New York, has issued an outline for a general course in rural sociology which is prepared by Gwendolyn S. Hughes. The outline covers a large number of subtopics and provides an extensive bibliography of books, pamphlets, and magazine articles.

The Research Service Company, of Los Angeles, California, has published the MacQuarrie Test for Mechanical Ability and the Los Angeles Reasoning in Arithmetic Test. The arithmetic test is diagnostic in character and is intended for use in Grades III-IX. Tentative age norms are available for both tests.

A rating scale for school habits has been devised by E. L. Cornell, W. W. Coxe, and J. S. Orleans, of the Educational Measurements Bureau of the New York State Department of Education. The scale, which has been published by the World Book Company, looks interesting. Nine habits are set up with brief statements indicating poor, fair, and good situations for each.

The Detroit Reading Tests by Claudia M. Parker and Evelyn A. Waterbury, assistant supervisors of reading in the Detroit public schools, have been published by the World Book Company. Test 1 is designed for Grade II, Test 2 for Grade III, Test 3 for Grades IV, V, and VI, and Test 4 for Grades VII, VIII, and IX. Several alternate forms are available for each test as are age and grade norms based on Detroit pupils.

The Parent-Teacher Association of the Ethical Culture School, New York, has issued a bulletin in which suggestions for parent-teacher work are given. This bulletin has grown to be the expression of an association which has done more than the normal type of work. Working methods, standing committees, publications, and concrete illustrations of programs, make the book a real help to members of new organizations.

Excessive School Building Costs: Causes and Remedies is the title of a report made to the joint legislative committee on economy and taxation by the Ohio State Association of Architects. The five chief causes of high building costs are stated as the war, labor conditions and material combined, the state building code, careless planning, and ineffective use of buildings. Numerous illustrations are given of waste under the code requirements, of poor planning, and ineffective use.

Sight Saving Schools: Their Organization and Administration is the title of a publication (No. 30) of the National Committee for the Prevention of Blindness. The bulletin takes up the aims of sight-saving classes, various administrative factors which need to be considered, the type of work done, and the legislation in this field in the different states.

Dr. Harold L. Camp, director of the Bureau of Educational Measurements, of the University of North Dakota, reported in June to each of the one hundred superintendents of schools in that state who participated in a state-wide survey in silent reading in December, 1926, and in May, 1927. The May testing showed a nice improvement over the December results in comprehension for all grades. In general, the speed also increased.

"The Purdue University Studies in Higher Education," Nos. 4 and 7, present results of some internal study of student problems. The first makes an examination of two methods of defining scholastic failure which has been in operation in that institution. The second reports the results of sectioning students on the basis of ability and particularly giving the opportunity to exceptionally strong students to do their work at double pace.

Winfield, Kansas, has worked out a rather elaborate outline of home-rule study for use in each of the years of a six-year high-school program. Such topics as health, citizenship, safety, and ethics are among the phases of personal and community life and the relationships which receive organized attention. The school publishes a book which elaborates for the use of both teachers and students the ideas and ideals which they are attempting to develop.

Kansas State Teachers College, at Emporia, Kansas, has been notably busy in promoting contests for high-school students during the past five years. In 1927, in addition to the contests in the various school subjects which had been a part of the program in the previous years, special contests were arranged in speech, art, and creative writing. William Allen White, Emporia editor, suggested the creative writing contest and provided the funds for the prizes.

Suggestions for Teaching English is the title of Bulletin 878 of the University of the State of New York. The Bulletin is written by Edwin B. Richards, supervisor of English, and Ethel L. Cornell, psychologist, Educational Measurements Bureau. The authors point out a large number of points to be considered which are obvious to those who have given much thought to the subject but which are too often overlooked by classroom teachers with little training or experience.

The report of the Philadelphia Division of Educational Research on Voluntary Testing in Spelling showed results from more than one thousand children in 155 elementary schools in Grades II-VIII, inclusive. The tests were used at the beginning and end of the second semester and revealed a gain in practically all half grades. The test was taken from the Iowa Spelling Scale and

the results show considerably above the Iowa norm with better results in the lower grades than in the upper. It should be noted, however, that the test was on words that had recently been studied, whereas the Iowa norm was developed without reference to whether the children had studied them recently or at all.

Under an award of the Commonwealth Fund, twenty-three honored graduates of British universities are entering American universities this fall for two years of study. This is the third annual group under these auspices. The universities which are being attended by these students are as follows: Harvard, Princeton, Massachusetts Institute of Technology, Yale, Columbia, Cornell, Pennsylvania, Johns Hopkins, Clark, Chicago, Stanford, North Carolina, and Michigan.

The International Institute of Teachers' College, Columbia University, has published a guidebook of some European school systems. The large number of American educators who are visiting Europe at the present time will welcome this book. In addition to a brief general statement as to school conditions, it gives special directions as to where more detailed information may be found. Austria, Belgium, France, Germany, Italy, Spain, and Switzerland are the countries considered in this guidebook.

The Committee on Industrial Teacher Training of the Pittsburgh Personnel Association has issued a report which attacks such problems as the selection of the industrial teacher, the rating of industrial teachers, how to conduct industrial teacher-training courses, and what to include in the training. The committee is thoroughly committed to the proposition that the material of instruction of an industrial teacher-training course should be constructed from a duty analysis of the industrial teacher.

The Division of Educational Research and Results of Philadelphia has published an analysis of promotion rates including subject promotion in junior high schools. The promotions for elementary schools, junior high schools, and senior high schools are given separately for ten-year periods, and the promotion rates in a few types of schools are compared. Comparisons are also made between promotion rates for boys and girls and among different subjects.

The *Educational Research Bulletins* of the Catholic University of America have reported several studies of interest to all workers in educational research. The constancy of intelligence quotients is treated in Volume I, No. 10. This is a review of the literature in the field with the conclusions which seem to be justified at the present time. Reading is considered in Volume II, Nos. 1, 2, 3, and 4—No. 1 deals with the content and measurement of the reading vocabulary; Nos. 2 and 3, with the present status of tests in silent reading; and No. 4, with a reading test for the primary grades. A comparative study of certain tests of achievement in high-school chemistry is presented in No. 5 of

the same volume, while in No. 6 is given a critical study of arithmetic reasoning tests. In each of these bulletins the problem is attacked in a thoroughly scientific manner and the conclusions are contributions to the literature in the field.

J. M. Foote, of the Division of Reference and Service of the Louisiana State Department of Education, has presented, in pamphlet form, the records and reports used in the Louisiana schools. These include census, attendance, and pupil-report cards; accumulative record cards; teachers' record cards; physical-plant inventory records; and finance records. "The State Department will welcome any suggestions for the improvement of the forms that school officers and teachers may find desirable."

The *University of Virginia Record Extension Series* for April, 1927, deals with secondary education in Virginia and is divided into two parts, "Research" and "The Educational Trend." Three topics are discussed in the first part, the first of which is a survey of methods by which English instruction may be adjusted to the individual differences of high-school pupils and concluded with the plan adapted to the Lynchburg High School. According to this plan, the pupils are first divided into ability groups on a basis of a series of tests after which weekly units of work are assigned to each group. These units differ both in quantity and quality of work expected in the different groups. The second and third topics deal with the functions of the school library in the socialized recitation and the adviser of girls, respectively. In view of the general trend toward greater activity in both these phases of secondary-school work, these discussions should be of considerable value to all schools interested in such activities.

The second part treats such problems as "school legislation of the special session and regional conferences of principals, both of which are of more local interest than the problems discussed in Part I. One topic, under the heading of "Educational Research," suggests a large number of investigations which come within the province of a research division in a state department of education. On the whole, the volume contains much material which should be helpful in both the administrative and instructional aspects of secondary education.

Physical Education in American Colleges and Universities is the title of a bulletin issued by the United States Bureau of Education. This study reports the requirements relative to the physical condition of students at entrance, the required work in physical education, military training, hygiene, athletics, student health service, and the equipment for physical activities. The summary points out that while a large number of colleges and universities require medical examination of all students at entrance and a large number of high schools allow a certain amount of physical education to fulfill graduation requirements, only two institutions of higher education allow high-school credits in physical education to be included among the entrance requirements. Hygiene, while considered important, is presented in various departments of different

institutions. The department of military training, the department of physical education, or the department of biology, physiology, or science, has charge of this work in one or more institutions. In general, it may be stated that the majority of colleges and universities are providing well-organized, healthful, educational, and recreational physical activities for their students.

The State University of Iowa, through the Bureau of Educational Research and Service, is fostering an extensive testing program. During the past year the following tests were used in various schools of the state: Thorndike-McCall Reading; Haggerty Reading, Sigma I; Stanford Reading; Courtis Arithmetic; Compass Diagnostic Arithmetic; Charters Diagnostic Language; Kirby Grammar; Ayres Handwriting, Gettysburg edition; Hotz Algebra; Ruch-Popenoe General Science; Iowa Physics. Results of the tests were tabulated by the Bureau and mimeographed reports sent back to the participating schools. The variety of tests and test results precludes any generalizations concerning them. The significance of the reports is found in the type of educational service rendered to the schools of the state.

A Report on the Progress of a Diagnostic and Remedial Study of Potentially and Actually Failing Students at Purdue University, is the title of an "Educational Reference Circular" issued by Purdue University and written by H. H. Remmers, assistant professor of education and psychology. In addition to a general discussion of the problems and the method used, a case study of nine students is given in detail. Among the trends observed and the quantitative data were the following: (1) These students are of a distinctly low capacity as compared with the total freshmen class. (2) The emotional adjustment of the group is on the average less adequate than for the class as a whole. (3) The members of the group are very deficient in reading, rate, and comprehension.

The quality of writing from the two sets of material was judged by means of the Ayres Handwriting Scale. A comparison of the median quality for each grade separate indicates that there was no significant difference in the quality of writing found on the formal test and in the compositions. This is in direct opposition to the opinion generally held that children write much better in a writing test or during the writing period than when they are doing other types of writing.

A joint committee of the American Association of Museums and the National Education Association has reported on the cooperation of schools and museums. Among the various items of the report which has been adopted by both of the associations, are the following statements which suggest the attitude of the committee in charge: (1) The schools and the museums should cooperate to enrich progressively the intellectual, cultural, and emotional life of the people. (2) The schools should lead in placing emphasis on nature study in the great out-door museum, where everything is alive. To promote such

activity, provision should be made for generous school gardens, for public parks within walking distance of every school building, and for free transportation to some observational area. (3) These primary experiences should be supplemented by contact with the material gathered in museums of science, art, history, and industry, whose contents should be placed at the service of the public schools. (4) The schools should make use of this material to the fullest extent possible. (5) The expenses of providing materials required for observation and for circulating and keeping in proper condition the traveling materials should be shared between the museums and the boards of education upon some mutually satisfactory basis.

Mimeographed bulletins from the Department of Reference and Research, of the high school at New Trier, Illinois, have recently come to us. One has to do with the study of adviser-room scholarship for the first semester and the other with individual teachers' grades with a comparison of grades given to boys and girls by departments. The discussion of scholarship as evidenced by the teachers' grades and the central tendencies for the various groups points out the frequently repeated fact that girls receive higher grades than boys, that there is wide variation among teachers, and that scholarship improves as the upper classes are reached.

The Department also reports a study of the relation between the classification index and the scholarship grades in the New Trier High School. The classification index is an average of the intelligence quotient and the educational quotient as determined by the Otis Classification Test. The results of the study show that the average classification index is highest in the acceleration classes and lowest in the retarded classes. This was to be expected. It is also of interest to note, however, that Latin had a high average classification index but a very low scholarship average and that retarded classes averaged also lowest in rating in industry and study habits.

Dean Wilbur Lucius Cross, in his 1925-26 report to the President of Yale University on the Graduate School, makes an interesting distinction between two types of mind with which graduate instruction is confronted. One type is known to all of us, not because it is especially common, but because the species has often been described and extravagantly praised. The man who has this type of mind not only pursues existing knowledge, but attempts to explain something that was unknown before. To him all learning owes its advancement; and we know him as the research worker. He may or may not be a superior teacher depending, as Dean Cross points out, upon whether he has "the tact and temper requisite for the profession."

The other type of mind with which the Graduate School comes in contact "finds its main satisfaction in the acquisition of knowledge with some play of the imagination over it for new interpretations." What Dean Cross has to say at this point is worthy of quotation.

. . . . Either from inability or indisposition, such a mind adds little or nothing to what is already known. As a student of this temper may make an excellent

college teacher up to a certain point, he is recognized as a valuable educational asset in the two-years training provided for him in the studies for the M.A. or the M.S. degree. It is a mistake for him to try to meet the research requirements for the Ph.D. degree. If he does not fail in the effort, he is in danger of losing his elasticity of spirit and of becoming a poor teacher as well as a poor investigator. Often possessing a facile pen, he is the man who in after years amuses the public with a burlesque account of graduate students solemnly engaged upon trivial problems devoid of all human interest.

Graduate schools everywhere are keenly interested in the students who have the research type of mind. The productivity of these men adds luster to the institution in which they took their training. But it seems to be true that in all graduate schools there must be a considerable amount of teaching done by the faculty. Since "the tact and temper requisite for the profession" does not necessarily accompany the research ability and since advancement in academic circles is largely on the basis of productivity rather than superior teaching, the selective process has tended to decrease rather than enhance the quality of teaching. It is highly probable, as Dean Cross points out, that the student with the non-research type of mind should not attempt to meet the requirements for the Ph.D. degree. On the other hand, there is a vital need for recognition of superior teaching as such—a recognition which ought to be as genuine as that given the possessor of the doctorate in philosophy. Graduate schools—from which college teachers should unquestionably be recruited—might well measure their success quite as much by the production of superior teachers as by the production of research workers; and they should also find a way to give equal recognition to equal ability in the two fields. It is a pleasure to record that Dean Cross in his address before the 1925 meeting of the Association of American Universities expressed somewhat this same view.

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Milwaukee Public Schools ALBERT H. FROEMMING

REVIEWS

BODE, BOYD H. *Modern Educational Theories.* New York, Macmillan Company, 1927. xiv + 351 pp.

Professor Bode is concerned with the manner in which "innovations that are advocated in the name of science and reform may become obstructions to the cultivation of fundamental educational values." Such a statement justifies one in expecting, first, that the author would have pronounced views as to what these "fundamental educational values" are, and, second, that he would possess considerable insight into those current movements and doctrines in the field of education to which the word "innovation" might apply. Both of these he does have, and not a few leaders in educational thought will find in his book a challenge that cannot be set aside.

The "fundamental educational values" according to Professor Bode, are to be found in the essence of democracy. For society as a whole and for education in particular, the highest principles of organization and of promotion are such as "mutual recognition of interests," increasing "responsibility for the continuous re-creation of the environment and of standards of conduct with reference to that respect for men with which we identify democracy," and the progressive "liberation of intelligence."

In connection with his advocacy for democracy lies one of the few disappointments in his splendid work. Only seldom are we advised in positive terms as to what democracy means in the way of definite procedures. On the other hand, we are told many times what some current definite procedures should not do. One wishes that Professor Bode had revealed in these pages a more complete sensitiveness to much which he holds in common with other defenders of the faith in democracy, some of whom he so ably criticises. As keeper of the faith, he is so vigilant against error that his stress upon the error leads to an apparent under-interpretation of the man and of the movement criticised. Probably some measure of this is unavoidable, but it is reasonable to believe that the proportions would have been better kept had more of the work been devoted to giving us hand-holds and controls, and to advancing more positive suggestions as to the way out of the difficulties which the various chapters so effectively uncover. Our sorest need is positive, cooperative, and constructive advocacy of democracy in education.

Such criticism of the book, however, is only in passing. The author sincerely conceives his function of critic in the field of educational thought, and he performs this function well. Few thinkers in the field have so keenly felt

and so accurately located the tendency of educational science to become dehumanized. He is quick also to sense the underlying assumptions, expressed and unexpressed, of the outstanding modern movements and doctrines in education. He sees deeply and is concerned. From his warmly human point of view he surveys these modern trends, marks their tendency to get dangerously into shallow waters and into deceptive harbors, and calls them back on to the main. The reader may find it necessary to differ strongly with the author, but he can never doubt the timeliness and the profound significance of the issues to which our attention is compelled. Education needed this book.

R. B. RAUP

Teachers College, Columbia University

BAGLEY, WILLIAM C., and KYTE, GEORGE C. *California Curriculum Study.* Berkeley, California, University of California, 1926. 430 pp.

The *California Curriculum Study* gives a general discussion of the evolution of the present elementary-school curriculum in California with special reference to its expression in legislative enactment. Interesting studies of public attitude toward this curriculum, county examinations, pupil mobility and its relationship to success in school, progress of pupils, and the causes of failure in terms of subject-matter difficulties are presented.

Twelve chapters submit an analysis of the various subjects taught in the California elementary schools. Many statistical tables are given which show findings relative to variation in grade placement, contrast between city and county courses of study, time allotments, pupil progress in varying conditions, brief extracts from curriculum studies, and the like.

The study is a comprehensive and, apparently, thorough view of the present situation as regards the elementary-school curriculum in California. The findings of the authors with respect to pupil mobility, the inference drawn as to the relationship of this to pupil failure, and the argument presented for a common "core" curriculum throughout the state constitute suggestions to be considered by curriculum-makers everywhere. One of the outstanding contributions of the study is the light thrown upon the condition in which a state will find its schools when one organized minority after another has its special interests legally prescribed in the curriculum.

The attitude of the public toward the elementary-school curriculum, as ascertained by questionnaires sent to selected groups of citizens, presents some interesting material. In feeling a need for change, the college teachers of education head the list by a substantial margin; high-school teachers, city-school superintendents, county-school superintendents, elementary-school teachers, and lay citizens follow in the order named. As to what the changes should be, the gap is wide between the college teachers of education and the other groups. This should be a matter of significance to all who are interested in curriculum-making.

A. L. THRELKELD

Denver Public Schools

BROWN, ANDREW W. *The Unevenness of Abilities of Dull and of Bright Children.* New York, Teachers College, Columbia University, 1926. vii + 112 pp. (Teachers College, Columbia University, Contributions to Education, No. 220)

The author describes "a comparative study of the relation between the abstract, mechanical, and non-verbal ability of dull and of bright boys." He "attempts to find out if mentally retarded children, as measured by the usual verbal test, are more or less specialized in their abilities than are bright children."

The Haggerty Intelligence Examination, Delta 2, is used to measure abstract ability; Pintner Non-Language Mental Test, to measure non-verbal ability; and Stenquist Mechanical Aptitude and Assembly Test, to measure mechanical ability. These tests were given to 456 boys of from ten to thirteen years. The dull group is the lowest 25 percent and the bright group is the highest 25 percent of the distribution from the abstract-ability test.

The author concludes that both dull and bright children are uneven in the abilities studied, but that they are "equally uneven." He finds no cause for agreement with other investigators who maintain that the feeble-minded are more uneven in their abilities than other children. There are, of course, wide variations in types of ability in the same child. A child may be high in abstract ability and low in mechanical ability, and vice versa. This makes it imperative that each individual be given educational and vocational guidance according to his need. Data from one type of test do not constitute sufficient basis for guidance of the child. "Ability to deal with abstract ideas may be the most important, but evidence reveals that it is not the only one."

The experiment is described in a careful and an excellent style. The statistical treatment is clear and the conclusions are well stated. The number of pupils involved, however, is too small and the dull group is not low enough in the scale of general intelligence to make the deductions convincing. The general philosophy of the author and his methods of discovery and treatment of unevenness of abilities are so sane that this little book is well worthy of consideration by all those engaged in the measurement, placement, and guidance of children.

VIRGIL E. DICKSON

University of California

CARROLL, ROBERT P. *An Experimental Study of Comprehension in Reading.* New York, Teachers College, Columbia University, 1926. v + 72 pp. (Teachers College, Columbia University, Contributions to Education, No. 245)

The author of this book believes that the ability to interpret "directions" accurately is an important accomplishment and calls attention to the proved fact that most persons are sadly inefficient in this respect. As a remedy for this inefficiency, he believes that school children should be given definite, intensive training in the reading and interpreting of printed directions. By

means of the three experiments described in this book, Dr. Carroll tried, first, to find out to what extent ability in the reading of directions may be improved by specific practice; second, to discover some effective method of teaching reading; third, to determine difficulties in the reading of directions; fourth, to study the relative difficulty of different kinds of directions; and fifth, to find the transfer effect of specific practice in this kind of material to similar and dissimilar types.

These experiments were carefully conducted in accordance with the experimental technique of W. A. McCall. Two practice groups and one control group were used in each experiment. These groups were carefully equated as to intelligence, mental age, and initial reading ability. Each of the first two experiments extended over a period of six weeks. The third experiment covered a period of three months. An original "Directions Test" was given to each group in the beginning to determine its initial standing, and at the end of the experiment to determine amount of progress. Various other tests were also used in the different experiments.

As a result of these experiments, the author draws the following conclusions: (1) Specific drill in reading "directions" produces marked improvement in the ability to read this particular type of material. (2) In order to teach reading effectively, the pupils' interest in self-improvement must be aroused. (3) There are five chief sources of error in the reading of directions. (4) The type of directions has little effect on the reading score. (5) Special drill in reading directions apparently has a decided effect on ability to read other types of material that demand careful, exact interpretation. (6) Such drill has little effect upon other mental functions involving careful and precise reading. (7) Pupils are typically inefficient in materials requiring complete and exact interpretation, but skill in such reading may be acquired by dint of appropriate practice.

The book is interestingly written, and the material is unusually well organized. It presents considerable conclusive evidence tending to verify the existence of conditions of which those experienced in educational measurements were already more or less definitely aware.

S. S. BROOKS

SCHWARTZ, HARWOOD M. *Improvement in the Maintenance of Public-School Buildings.* New York, Teachers College, Columbia University, 1926. ix + 74 pp. (Teachers College, Columbia University, Contributions to Education, No. 240)

In the words of the author, the purpose of this Doctor's dissertation is

to determine scientificially the elements of public-school buildings that are most frequently repaired and the relative importance of such repairs. The study further attempts to determine the relationships existing between the six factors: size of building, average yearly cost of repairs for each equivalent classroom, age of building, score of building, and type of building.

The data were taken from a certain city labeled by the author, "City 6."

After setting up a technique, the author proceeds to an analysis of the "frequency and the relative importance of the several types of repairs." The result is interesting but not convincing, even to the author, because of the inadequacies of the accounting technique. The conclusions reached are typical survey summaries based upon the available data and treated with proper caution by the author.

An attempt is made, in Chapter III, to determine "the relationships, if any, that exist among the factors of average yearly cost of repairs for each classroom, age of the building, size of building, score of building, and type of building," with the purpose of securing a prediction formula. After treating these data statistically, the author concludes that "age, score, size, and type of the buildings are not the most important factors in determining the repairs in City 6." Some further conclusions are rather obvious.

A critical examination of the method employed leads to the belief that probably the most important factors in building upkeep—those of type and quality of material, method and adequacy of construction, climate, daily use, and operating methods—have not been given serious enough consideration. For this there may be a good reason. They could not be determined. As vital variables, however, they should have been given an important place in the discussion.

Dr. Schwartz has called attention in this study to the inadequacies of detailed accounting technique and has suggested a system for meeting some of the inadequacies. This seems to the reviewer to be the major contribution of the publication, rather than that indicated in the introduction.

ARTHUR MOEHLMAN
University of Michigan

MOEHLMAN, ARTHUR B. *Public School Finance.* New York, Rand McNally and Company, 1927. xviii + 508 pp.

The most enthusiastic advocate of extension of the facilities of public education will admit that this great national institution—known as our public schools—has taken on such vast proportions that its finance is a serious problem. From the laymen, and now and then from school men themselves, come proffered solutions that are the height of folly. These range all the way from the recommendation of the confiscation for public education of a "fraction of what is spent for luxuries," to "just using economically what money there is," or, what may be worse, selecting those who are "entitled to an education" and sending the others on about their business with a minimum of the acquisitions necessary to carry on "the everyday affairs of life on the lower social levels."

Here is a book that will be welcomed by all those who seek a reasonable solution of the financial problem in all its aspects, a solution based on a wide range of personal experience. It begins with a sane and unequivocal philosophy of public education in an ever-changing democracy, on the assumption that an understanding of our problem is necessary before we can propose any reasonable

solution. Then we are given an insight into the professional planning of public education, involving the enlightenment of a constituency to support an educational program in harmony with is social needs; the mechanics of a good financial policy; the application, step by step, of the techniques of good financing; and an appraisal of the results of the techniques as proposed. There is a fine regard for, and a nicety of discrimination in, the employment of technical terms. These are so simply used and so fully explained that the layman and novice alike will understand.

Ample footnotes, copious cross references, up-to-date bibliographies, and suggested readings for special studies are accurately given. A uniform policy in the presentation and listing of the hundreds of statistical tables, figures, graphs, charts—without the use of cumbersome inserts—and with only a few minor errors of a typographical character, instills confidence and invites a critical study of the textual material, the continuity of which is not violated. An adequate table of contents and an index make the book still more useful to the student in search of answers to special problems.

The experienced superintendent will have occasion to turn to this book for the verification of policies and the evidence of improvements in classification and practice. The beginner will find it a veritable mine of information in answer to the questions that are certain to confront him. The layman and board member will find here a wealth of technical education that will increase their respect for the modern school man who has kept abreast of the times. Every teacher should read the chapter on "Internal Accounting." It will have a wholesome effect on the school morale.

OSCAR F. WEBER

University of Illinois

HANSEN, ALLEN OSCAR. *Liberalism and American Education in the Eighteenth Century.* New York, The Macmillan Company, 1926. xxv + 317 pp.

One of the dominant ideas of the Enlightenment was that of "the indefinite perfectibility of man and institutions." This conception profoundly influenced the leading American thinkers in the eighteenth century, and it played a significant part in their recommendations concerning the organization of the new republican form of government. They were convinced that the state must not be a fixed institution, otherwise revolution or decay would follow—to enjoy progress, it must be flexible. This could be achieved only through the establishment of a national system of education, which system should consider the perfectibility of the citizen. The mode of education should be adapted to the needs of a growing, creative being.

The American expression of this idea is admirably shown in Dr. Hansen's careful analysis and interpretation of the plans for a national system of education as advocated by Benjamin Rush, Robert Coram, James Sullivan, Nathaniel Chipman, Samuel Knox, Samuel H. Smith, and Noah Webster, during the years 1786-1800. The plans of Lafitte du Courteil and Du Pont de Nemours, and the activities of the American Philosophical Society, are given

their proper place in the discussion. The author indicates clearly the principle underlying the major discussions of the time, that is, that "the ends of democracy could not be achieved without a system of education correlative to that form of social control."

The book gives evidence of much intensive research. The sources are used in scholarly fashion to produce a well-reasoned and useful treatise. In spite of its minute examination and analysis of the sources, the treatment is clear and interesting. Dr. Hansen should be congratulated on the production of the first exhaustive study of an important phase of early American education.

ROBERT FRANCIS SEYBOLT
University of Illinois

REAVIS, WILLIAM CLAUDE. *Pupil Adjustment in Junior and Senior High Schools.* Boston, D. C. Heath and Company, 1926. xviii + 348 pp.

In this small book, which the teacher can digest in a few hours, Principal Reavis, of the University of Chicago High School, sets forth the experience of this school in dealing with its pupils as a physician treats the young patient who has been his charge since birth. Principal Reavis makes a plea for a most thorough diagnosis of the condition of each pupil as the necessary basis for the constructive remedying of individual cases of maladjustment.

Part I sets forth the technique of the case method as employed in that school. In Part II are described actual cases giving the symptoms, the diagnosis, the treatment, and the immediate results. Each case is reported with the same detail that a physician would employ in a report to a medical society. Notwithstanding the minute procedure here recorded, I feel that it falls behind medical diagnosis in definiteness. If a child has a fever of 102°, the physician does not content himself with a study of the general conditions present and immediately preceding but seeks for the immediate provoking cause of the disturbance. This same technique Courtis applied in his study of the causes of failure in arithmetical processes. Unfortunately, few teachers realize that pupils' failures in a subject are often due to a single principle or step in the process not mastered on a certain day—a defect in the learning process which the teacher should have discovered and remedied.

I wish the members of every school board could read this book not so much to be converted to the thesis of Principal Reavis as to gain a vision of what present-day scientific education—practiced in the University High School—means to the individual child as compared with the mass education which is so prevalent in our public high schools. I also wish that every teacher in our public schools could read it in order to discover the tools which are now at his disposal and to have again impressed upon him the fundamental truth that teaching worthy of the name is always the interaction of two personalities, that mass production is not possible in education. I would not have him gain the impression that every failure in his classes is due to a physical defect in the pupil or to something askew in his environment. In all too many cases of failure, the teacher himself is the most vital element in the environment. Let

us follow Principal Reavis in adopting most thorough diagnosis of our cases, but let us beware of viewing every failure as a case for a psychiatrist or a physician.

JOHN L. TILDSLEY

New York Public Schools

WENTWORTH, MARY M. *Individual Differences in the Intelligence of School Children.* Cambridge, Massachusetts, Harvard University Press, 1926. 162 pp. (Harvard Studies in Education, No. 7)

Part of a larger investigation of the mental and physical development of school children is reported in this study. Results of testing one thousand first-grade children with the Stanford-Binet and retests of 145 cases when in the second grade are presented. In addition, results of group tests of intelligence, educational tests, and physical measurements of many cases in two consecutive years are included.

The Binet results for the total group indicate a normal distribution of intelligence quotients with a mean at 97.7. Distributions of groups tested with the Dearborn Examination A are also given, although the individuals are not identical with those tested with the Binet. Correlations between Stanford and Dearborn of .72 and .68 are reported. Anatomical ages for 489 children are likewise reported.

At intervals varying from three days to sixteen months, 145 children were retested on the Binet. The correlation is .82, and the median change in intelligence quotient is five points. The author lists all these 145 cases with the amount of change in intelligence quotient and discusses in detail the probable causes of change. Particularly valuable is her analysis of failure in the second tests after a previous success in the first test. With some tests this is fairly common, with others it rarely, if ever, occurs. The author raises pertinent questions as to the scoring of certain tests which would seem to cause this fluctuation. A similar, but less detailed, study of the retests on the Dearborn Group Test is made.

The rest of the book, indeed, the major portion, is devoted to 112 individual case studies. These are grouped into twins, superior, psychopathic, mentally deficient children, and other groups. The degree of usefulness of such case studies to the student is difficult to ascertain, however useful and desirable they may be to the teacher or psychologist in charge of a case. No summary of the sixteen pairs of twins is given, although all the detailed measurements are there for anyone who might wish to measure the amount of resemblance in many traits. So it is with the other groups of cases reported. The study as a whole, however, is of decided value, although nothing strikingly new has come to light.

R. PINTNER

Teachers College, Columbia University

PUBLICATIONS RECEIVED, JULY 15 TO AUGUST 15

BOOKS FOR EDUCATIONAL EXECUTIVES

Almack, J. C. *The school board member.* New York, Macmillan, 1927. 281 pp. $1.50.

Carroll, R. P. *A drill book in methods of computation in educational measurements.* Syracuse, N. Y., Univ. Bk. Store, 1926. 128 pp. $1.80.

Columbia University. Teachers College. Institute of Educational Research. Division of Field Studies. *Report of the survey of the schools of Fort Lee, New Jersey.* New York, Teachers College, Columbia Univ., 1927. 136 pp. $.65.

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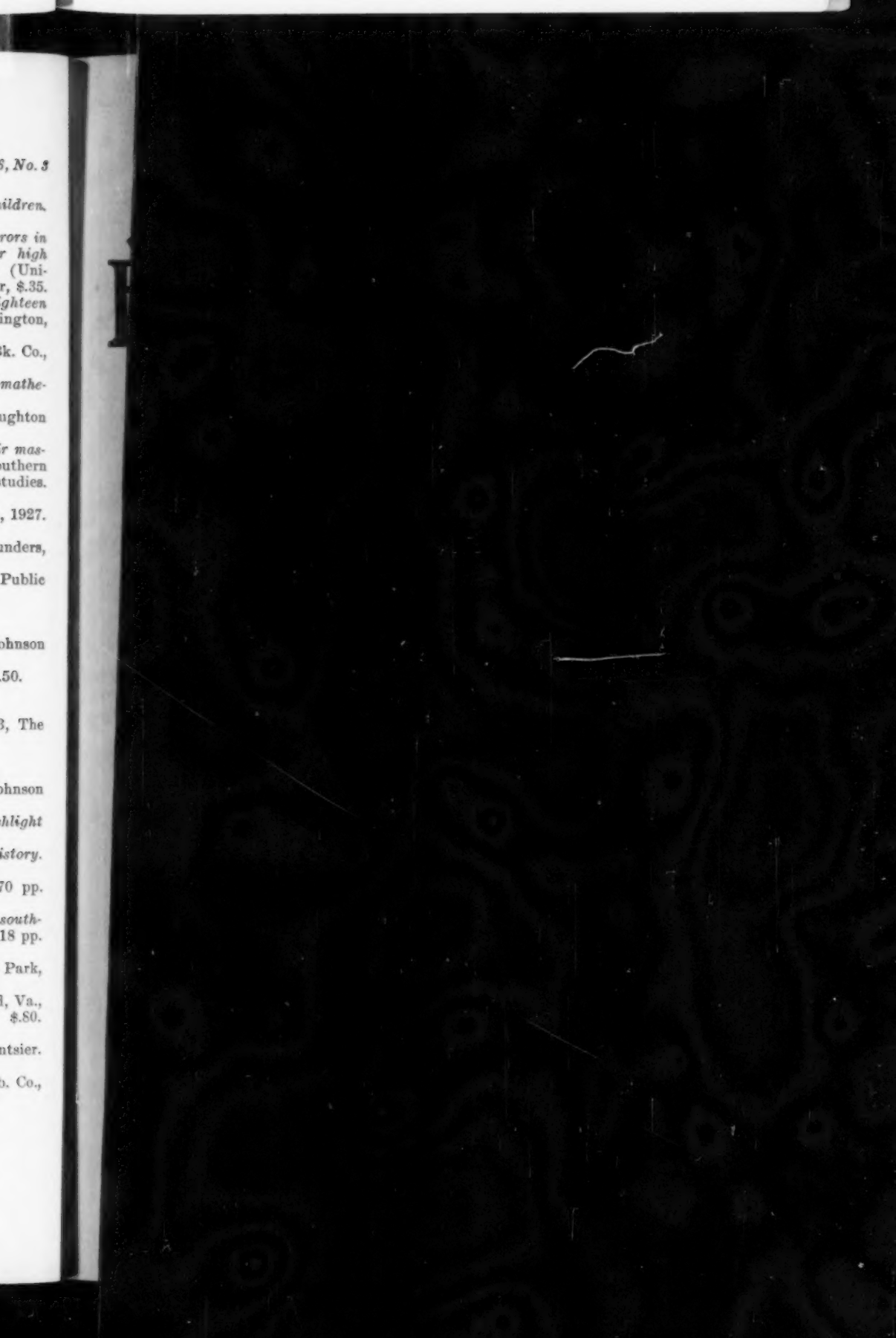
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